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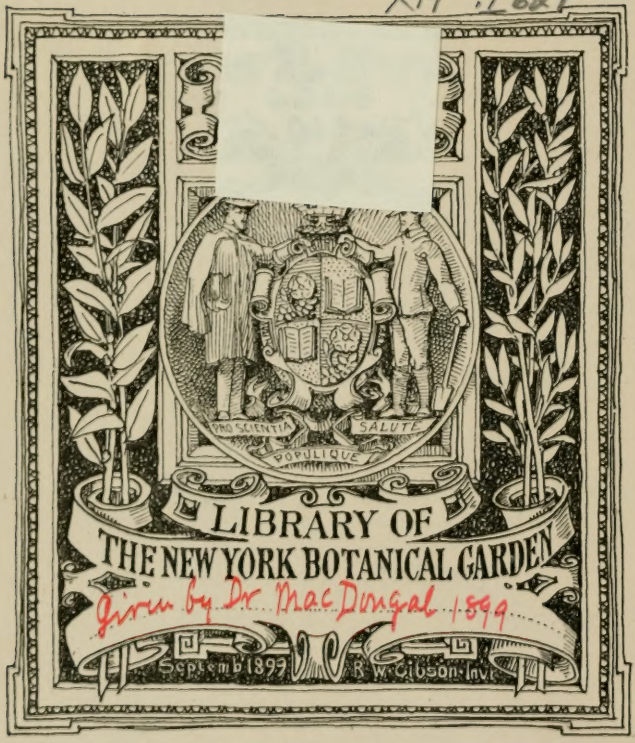
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PROCEEDINGS, ESSAYS AND REPORTS

AT THE

ANNUAL WINTER MEETING

HELD AT

Minneapolis, Jan. 20th, 21st and 22d, 1880.

Prepared by CHAS. Y. LACY, Secretary.

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OFFICERS FOR 1880.

PRESIDENT.

J. T. GRIMES.....Minneapolis.

VICE PRESIDENTS.

E. H. S. DART, First District.....Owatonna.
DITUS DAY, Second District.....Farmington.
W. E. BRIMHALL, Third District.....St. Paul.

SECRETARY.

U. S. HOLLISTER.....St. Paul.

TREASURER.

A. W. SIAS.....Rochester.

STANDING COMMITTEES.

EXECUTIVE.

T. M. SMITH.....St. Paul.
WYMAN ELLIOT.....Minneapolis.
J. M. UNDERWOOD.....Lake City.
D. W. HUMPHREY.....Faribault.
F. G. GOULD.....Excelsior.
President and Secretary, *ex officio*.

HORTICULTURAL LITERATURE.

(See page 98.)

R. J. MENDENHALL.....Minneapolis.
T. G. CARTER.....St. Peter.
J. S. HARRIS.....La Crescent.

DELEGATES TO MEETING OF STATE AGR. SOCIETY.

U. S. HOLLISTER.....St. Paul.
WM. E. BRIMHALL.....St. Paul.
DR. R. W. TWITCHELL.....Chatfield.
D. DAY.....Farmington.
H. D. ELDRIDGE.....Excelsior.

COMMITTEE ON RUSSIAN APPLES.

(See page 73.)

J. T. GRIMES.....Minneapolis.
E. H. S. DART.....Owatonna.
J. M. UNDERWOOD.....Lake City.
A. W. SIAS.....Rochester.
A. W. LATHAM.....Excelsior.

COMMITTEE ON SEEDLING APPLES.

(See page 82.)

D. DAY.....Farmington.
F. G. GOULD.....Excelsior.
G. W. FULLER.....Litchfield.
M. PEARCE.....Rochester.
J. S. HARRIS.....La Crescent.

COMMITTEE ON TAXING NURSERY STOCK.

G. W. FULLER.....Litchfield.
E. H. S. DART.....Owatonna.
A. W. SIAS.....Rochester.

COMMITTEE ON EXPERIMENTAL FARMS.

WYMAN ELLIOT.....Minneapolis.
M. W. COOK.....Rochester.
H. D. ELDRIDGE.....Excelsior.

DELEGATE TO WIS. HORT. MEETING.

J. M. UNDERWOOD.....Lake City.

GENERAL FRUIT COMMITTEE.

1. L. D. MILLS.....Garden City, Blue Earth county.
2. O. D. STORRS.....Winsted, McLeod county.
3. DR. R. W. TWITCHEL.....Chatfield, Fillmore county.
4. WM. E. BRIMHALL.....St. Paul, Ramsey county.

5. DITUS DAY ..... Farmington, Dakota county.
6. G. W. FULLER ..... Litchfield, Meeker county.
7. GEO. H. FISH ..... Sauk Centre, Stearns county.
8. J. M BROWN ..... La Crescent, Houston county.
9. J. M. NORQUIST ..... Red Wing, Goodhue county.
10. OLIVER GIBBS, JR ..... Lake City, Wabasha county.
11. E. B. JORDON ..... Rochester, Olmsted county.
12. D. W. HUMPHREY ..... Faribault, Rice county.
13. T. G. CARTER ..... St. Peter, Nicollet county.
14. M. ERWIN MATTHEWS ..... Foster, Big Stone county.
15. R. M. PROBSTFIELD ..... Moorhead, Clay county.
16. A. MORSE ..... Austin, Mower county.
17. F. G. GOULD ..... Excelsior, Hennepin county.

MEMBERS FOR 1880.

Andrews, John B.....Faribault, Rice county.
Bliss, A. S.....Minneapolis, Hennepin county.
Bunnell, M. C.....Lake City, Wabasha county
Brown, J. M.....La Crescent, Houston county.
Burrington, L. M.....St. Paul, Ramsey county.
Brimhall, Wm. E.....St. Paul, Ramsey county.
Cook, M. W.....Rochester, Olmsted county.
Carter, T. G.....St. Peter, Nicollet county.
Cannon, Wm.....Fort A. Lincoln, D. T.
Cotterell, R. L.....Dover, Olmsted county.
Chowen, W. S.....Minnetonka, Hennepin county.
Crawford, Matthew.....Cuyahoga Falls, Ohio.
Day, D.....Farmington, Dakota county.
Day, L. E.....Farmington, Dakota county.
Day, A. A.....Farmington, Dakota county.
Dart, E. H. S.....Owatonna, Steele county.
Elliot, Wyman.....Minneapolis, Hennepin county.
Eldridge, H. D.....Excelsior, Hennepin county.
Emery, ——.....Eake City, Wabasha county.
Fuller, G. W.....Litchfield, Meeker county.
Fish, Geo. H.....Sauk Center, Stearns county.
Fleischer, J. C.....St. Paul, Ramsey county.
Fowler, Wm.....Newport, Washington county.
Gibbs, Oliver, Jr.....Lake City, Wabasha county.
Gould, F. G.....Excelsior, Hennepin county.
Grimes, J. T.....Minneapolis, Hennepin county.
Hollister, U. S.....St. Paul, Ramsey county.
Humphrey, D. W.....Faribault, Rice county.
Howe, G. H.....Minneapolis, Hennepin county.
Hendrickson, W. E.....St. Paul, Ramsey county.
Hawkinson, Chas.....Ortonville, Big Stone county.
Jaquith, O.....Excelsior, Hennepin county.
Jordon, E. B.....Rochester, Olmsted county.
Knaupheide, R.....St. Paul, Ramsey county.
Kenney, Seth H.....Morristown, Rice county.
Lyon, Wm.....Minneapolis, Hennepin county.
Lowell, H. E.....Washburne, Hennepin county.
Lyman, Wyllis.....Minneapolis, Hennepin county.
Matthews, M. Irwin.....Foster, Big Stone county.
Morse, A.....Austin, Mower county.

McHenry, Wm.....St. Charles, Winona county.
Mendenhall, R. J.....Minneapolis, Hennepin county.
Miller, C. F.....Dundas, Rice county.
Mills, L. D.....Garden City, Blue Earth county.
Norquist, J.....Red Wing, Goodhue county.
Pearce, M.....Rochester, Olmsted county.
Probstfield, R. M.....Moorhead, Clay county.
Phillips, Geo. C.....Minnetonka, Hennepin county.
Storrs, O. D.....Winsted, McLeod county.
Smith, T. M.....St. Paul, Ramsey county.
Sias, A. W.....Rochester, Olmsted county.
Thompson, Josiah.....Minneapolis, Hennepin county.
Twitchell, Dr. R. W.....Chatfield, Fillmore county.
Tuttle, Rev. J. H.....Minneapolis, Hennepin county.
Underwood, J. M.....Lake City, Wabasha county.

HONORARY MEMBERS.

Miss Hortense Share.....Rosemont, Minn.....elected 1877
Mrs. C. O. Van Cleve.....Minneapolis, Minn.....elected 1877

LIFE MEMBERS.

Mrs. Wm. Paist.....Hersey, Minn.
Col. J. H. Stevens.....Minneapolis.
J. S. Harris.....La Crescent.
Chas. Y. Lacy.....Minneapolis.

FRUIT LISTS.

APPROVED OR REVISED BY THE STATE HORTICULTURAL SOCIETY AT THE ANNUAL MEETING AT MINNEAPOLIS, JAN. 20 TO 22, 1880.

NOTE.—Since the following lists represent the action taken at two or more meetings the votes are generally omitted: in case of varieties changed at the last meeting the votes may be learned by referring to the discussion on page indicated.

APPLES.

(For discussion see page 86.)

Recommended for general cultivation:

Duchess of Oldenburg.
Wealthy.

Recommended for planting in limited qualities:

Tetofsky.

Recommended for general cultivation in favorable localities:

Haas,
Rollins' Pippin,
St. Lawrence.

Recommended for favorable localities in southern portions of the State:

Plumb's Cider.
Price's Sweet.
Utter's Red,
Fameuse,
Saxton,
Talman's Sweet.

Recommended for general trial throughout the State:

White Astrachan,
Elgin Beauty,
Peach.

Recommended for trial by amateurs and pomologists:

Alaska,
Julia,
Molly,
Clayson,
Kimball,
Hart's Seedling, No. 7,
Malinda,
Walbridge,
Hotchkiss' Greening,
Giant Swaar.
Winsted Pippin,
Queen of Elgin,
Rollin's Pippin,
Rollin's Russet,
Rollin's Prolific,
Wabasha,
Hart's Seedling, No. 11,
Yearley's Winter,
Frost's Seedling.

CRAB APPLES.

Recommended for general cultivation:

Transcendent (liable to blight,)
Hyslop,
Beach's Sweet.
Orange,
Early Strawberry,

Recommended for planting in limited quantities:

Conical,
Hesper Blush.
Maiden's Blush,

Recommended for general trial:

Powers' Large Red,
General Grant,
Whitney's No. 20.
Virginia,
Beach's Red,

Recommended for trial by amateurs and pomologists:

Minnesota,
Aiken's Str. Winter,
Alaska,
Hutchinson's Sweet
Brier's Sweet,
Quaker Beauty,
Woodland Winter,

BLIGHT.

NOTE.—These lists have not been amended since they were formed, and they consequently represent the action taken in January, 1878.

Varieties quite exempt from blight:

Orange, (unanimous vote,)
Beach's Sweet, (unanimous vote,)
Conical, (unanimous vote,)
Maiden's Blush, (unanimous vote,)
Whitney's No. 20, (unanimous vote,)
Minnesota, (unanimous vote,)
Powers' Large Red, (unanimous vote,)
Early Strawberry, (9 for and 1 against,)
Virginia, (6 for and 1 against,)
Beach's Red, (unanimous vote,)

Varieties quite liable to blight:

General Grant, (unanimous vote,)
Transcendent (10 for and 1 against.)
Hyslop, (14 for and 1 against,)

Varieties recommended and not named in these lists were not assigned, either for want of sufficient knowledge, or because they are not decidedly exempt from blight, or decidedly liable to it.

GRAPES.

(Not changed since January, 1879.)

Recommended for general cultivation:

Concord, Delaware.

Recommended for planting in limited quantities:

Hartford Prolific, Northern Muscadine,
Clinton, Eumelan,
Roger's No. 15, or Agawam.

Recommended for trial:

Iona,
Janesville, for its earliness,
Roger's No. 4, or Wilder,
Roger's No. 9, or Lindley.
Roger's No. 19, or Merrimack.

STRAWBERRIES.

(Not changed since January, 1879.)

Recommended for general cultivation:

Wilson's Albany.

Recommended for general cultivation for near market and home use:

Downer's Prolific, Charles Downing,
Green Prolific, Countess de Haricourt.

Recommended for trial:

Seth Boyden, Col Cheney,
Kentucky, Prouty's Seedling,
Michigan Seedling, Kramer's Seedling.

For general trial for amateur cultivation:

Hart's Minnesota Seedling.

RASPBERRIES—BLACK-CAPS.

(Not changed since January, 1879.)

Recommended for general cultivation:

Doolittle, Seneca.

Recommended for trial:

Ontario.

RASPBERRIES—RED.

Recommended for general cultivation:

Philadelphia. Turner.

CURRANTS.

(Action of 1877.)

Recommended for general cultivation:

Red Dutch, Victoria,
White Grape.

Recommended for general cultivation as a black variety:

Black Naples.

Recommended for trial:

Stewart's Seedling.

PLUMS.

(Action of 1876)

Resolved, That in view of the vast number and variety of native plums of great excellence in our State, and the uncertainty of getting a genuine article by importation, therefore we recommend that our people depend principally upon our own native plums for a supply.

Recommended for trial:

Miner, De Soto.

GOOSEBERRIES.

None were recommended.

EVERGREENS.

List adopted 1876 and approved 1877. The votes recorded are those of 1876.

White Spruce, 1st. (10 for, 8 against.)
Norway Spruce, 2d. (11 for, 8 against.)
Scotch Pine, 3d. (13 for, none against.)
Balsam Fir, 4th. (15 for, none against.)
White Pine, 5th. (11 for, none against.)
American Arbor Vitæ, 6th. (11 for, 2 against.)
Red Cedar, 7th. (11 for, 4 against.)
Red or Norway Pine, 8th. (11 for, none against.)
Austrian Pine, 9th. (9 for, 7 against.)
Mountain Pine, 10th, (8 for, none against.)

Siberian Arbor Vitæ, 11th. (14 for, none against.)
Trailing Juniper, 12th. (13 for, none against.)

TREES FOR FOREST PLANTING.

(Action of 1879.)

Deciduous:

Cottonwood,
White Willow,
White or Rock Elm,
Butternut.
} For moist soil.
Sugar Maple,
White Ash,
Box Elder,

Deciduous Conifer:

European Larch.

Evergreens:

Scotch Pine,
White Pine,
Red Cedar,
Black Spruce.

Arbor Vitæ,
Balsam Fir,
Norway Spruce,

PROCEEEDINGS

AT THE

WINTER MEETING,

HELD AT MINNEAPOLIS, TUESDAY, WEDNESDAY AND THURSDAY, JANUARY 20, 21, AND 22, 1880.

PROGRAMME.

TUESDAY MORNING—10 O'CLOCK.

Informal addresses and discussion of subjects not named in the following programme. Payment of membership fees, &c.

TUESDAY AFTERNOON.

1. Orchards for Profit; paper by Wm. E. Brimhall, of St. Paul.
2. Discussion, embracing the above paper, and the following: (1) Have Apples Been Grown at a Profit in Minnesota? (2) What Varieties Have Paid Best? (3) Cultivation and Care of Apple Trees; (4) Winter-killing of Fruit Trees—Cause and Prevention.
3. Appointment of Committees on Articles on Exhibition, on Final Resolutions and Auditing Committee.

TUESDAY EVENING.

1. The Garden on the Farm; paper by U. S. Hollister, of St. Paul.
2. Discussion on same.
3. Locations and Exposures for Orchards; paper by M. Pearce, of Rochester.
4. Discussion on same.

WEDNESDAY MORNING.

1. Strawberry Culture; paper by M. W. Cook, of Rochester.
2. Discussion on same.
3. Methods of Improving Fruits and Originating New Varieties Adapted to the Northwest; paper by J. S. Harris, of La Crescent.
4. The Production of Seedlings and the Introduction of Russian Varieties; letter to the Secretary, from J. L. Budd, Professor of Horticulture in Iowa Agricultural College, and Secretary Iowa Horticultural Society.
5. Discussion of the above paper and letter.

WEDNESDAY AFTERNOON.

1. Reports on Russian Varieties of Apples, by members of Committee—J. T. Grimes, Minneapolis; E. H. S. Dart, Owatonna; J. M. Underwood, Lake City; A. W. Sias, Rochester; A. W. Latham, Excelsior.
2. Discussion on same.
3. Reports on Seedling Apples, by members of Committee—D. Day, Farmington; F. G. Gould, Excelsior; G. W. Fuller, Litchfield; M. Pearce, Rochester; J. S. Harris, La Crescent.
4. Discussion on same.

WEDNESDAY EVENING.

1. Annual Address of the President, J. T. Grimes, Esq., of Minneapolis.
2. Discussion on subjects presented in the Address (and appointment of Committee on same.)
3. Twenty-five Years Advance of Horticulture in Minnesota; paper by L. M. Ford, of St. Paul.
4. Discussion on same.

THURSDAY MORNING.

1. Forest Tree Seeds, When they Ripen, How to Gather and How to Plant Them, and How to Care for the Young Seedlings; paper by the Hon. L. B. Hodges, of St. Paul.
2. Discussion on same, including "How to Grow Mountain Ash from the Seed."
3. Reports of Secretary and Treasurer.
4. Discussion on same (and Appointment of Committees.)
5. Election of Officers by Ballot, without Nomination.

THURSDAY AFTERNOON.

1. Destructive Insects; report by Hon. R. J. Mendenhall, of Minneapolis.
2. Discussion on same.
3. Discussion on questions relating to Floriculture.
4. Blight, its Nature, Cause, and Prevention; paper by E. B. Jordon, of Rochester.
5. Discussion on same.

THURSDAY EVENING.

1. Horticulture; paper by Dr. R. W. Twitchell, of Chatfield.
2. Discussion on same.
3. Reports on Condition and Prospects of Fruit Culture in different parts of the State, by Geo. H. Fish, of Sauk Center, T. G. Carter, of St. Peter, and others. Discussion following each report.
4. Report of Committee on Resolutions.

With regard to the foregoing subjects it is desirable not to change their places in the programme, in order that those unable to be present all the time may know when to expect the subjects that are of special interest to

them. With regard to the following papers and subjects for discussion, no definite place in the Programme could be assigned them in advance. They may therefore be taken up at the pleasure of the Society when it will not interfere with the foregoing.

The Catalpa in Minnesota; paper by Col. J. H. Stevens, of Minneapolis.

Raspberry Culture; paper by J. W. Boxell, of Valley Creek.

Farmers' Orchards; discussion.

Methods of Preserving Fruit; discussion.

City Gardens; discussion.

Marketing Fruit; discussion.

The Purchase of Untried Varieties of Fruits and Plants at Fancy Prices; discussion.

Uses for Crab Apples; discussion.

Improvement and Adornment of Public School Grounds; discussion.

Our Horticultural Literature; discussion.

Shade Trees for Public Highways, Best Kinds, Size, Distance to Set, etc.; discussion.

Revision of Fruit and Tree Lists.—(1) Apples, (2) Crab-apples, (3) Blight, (4) Grapes, (5) Strawberries, (6) Raspberries, (7) Currants, (8) Plums, (9) Evergreens, (10) Trees for Forest Planting.

The meeting will be held in the Council Room, City Hall, which will be kept constantly warm for the protection of fruits and plants on exhibition. Entertainment will be furnished to members of the Society on application to Col. J. H. Stevens, Chairman of Committee. The Clark House offers the reduced terms of $1.50 per day, the usual rate being $2.00. The railways leading into Minneapolis will sell tickets at reduced rates, on presentation of *special* certificate of the Secretary (not the regular membership certificate.)

The annual membership fee is one dollar, but the meetings of the Society are *open and free to all*, and it is believed that the exhibition of fruits and flowers, together with the interesting nature of the papers and discussions will richly pay for the trouble of attending. The promised exhibition of five or six bushels of Wealthy Apples, by Wyman Elliot, Esq., should alone draw a large attendance, when it is remembered that this is, both tree and fruit, the product of Minnesota soil and climate. Several florists have promised to contribute plants.

J. T. GRIMES, President.
CHAS. Y. LACY, Secretary.
J. M. UNDERWOOD, Treasurer.

TUESDAY MORNING.

The society was called to order by President J. T. Grimes, at 10:45, in accordance with notice given through the press, and circular announcements, which had been mailed to the members of the society and a large number of others, supposed to be interested in horticulture or some of its branches.

A short selection of music was rendered on the organ by Miss Grimes.

REMARKS OF COL. KING.

Col. W. S. King and Rev. J. H. Tuttle were invited to seats on the speaker's platform.

At the conclusion of the music Col. King made a short speech of greeting, and in the name of the Mayor of Minneapolis extended a warm, cordial and hearty welcome to the Minnesota State Horticultural Society. He said the people of Minneapolis felt a warm interest in the work of the society, and were glad to extend courtesy and hospitality of the city to its members.

PRESIDENT GRIMES' REPLY.

President Grimes replied saying the Society was pleased to meet there and appreciated its cordial welcome. He pledged the thanks of the society to the Mayor and Council for their courtesy and generosity in placing the council room at the disposal of the society. He said they were there not from any selfish motives but from a love for their calling—a love for the fruits and flowers which add to the comforts of home. He said the people of Minneapolis had always taken an interest in horticulture, which was shown by their shaded streets, the planting of yards, &c. He paid a compliment to the courage and enterprize of the business men of Minneapolis, whose ardor neither floods or explosions could dampen.

Prayer was then offered by Rev. Mr. Tuttle, after which a vocal selection was rendered by Misses Grimes and Hutchins.

MR. BOXELL'S PAPER.

There being no special order of business for the morning, it was voted to listen to the paper on Raspberry Culture, by Mr. J. W. Boxell, of Valley Creek, and it was accordingly read by the secretary, as follows:

RASPBERRY CULTURE.

Secretary Minnesota State Horticultural Society:

Dear Sir:—In compliance with your request, I send you a paper on Raspberry Culture, which will have, at least, the negative merit of brevity.

Varieties.

I have not tried all the varieties, but the only kinds I would plant largely, are the Doolittle and Seneca Black-caps, and the Turner and Philadelphia Reds. The Clark is not hardy enough, and the Kirtland is not quite productive enough; and, for the last two seasons, has been affected by a sort of blight, giving a portion of the fruit a slight bitterish taste. Davison's Thornless has not been sufficiently productive with me, nor has the Mammoth Cluster proved profitable, not being hardy enough, nor the fruit of first rate quality.

I formerly had enormous crops of Philadelphias, but for some reason they have not done quite so well for a few years past.

The Turner is fairly productive, entirely hardy, with me, and the quality is the very best. For two seasons past, it has done better with me than any other variety, red or black.

I am extremely fond of large, juicy, well-ripened black raspberries, such as the Senecas, or the Doolittles when the bushes are young and well cultivated. But this is not "Raspberry Culture." I cannot write a treatise at present giving all the particulars of planting and cultivation, and, in fact, it seems hardly necessary. I will try to make a few strong points.

Soil, Distance, Cultivation, &c.

It is only by very high culture that raising raspberries for market can be made continuously profitable. They do best on a rich, deep, thoroughly drained soil. I observe that on low spots in the patch, depressions of a few feet only, they winter-kill worse than elsewhere. Plant none but strong plants, especially of the Black-Caps. Plant tolerably early in the spring, and aim to get a good stand the first year. If you expect a full crop, you must have no blank spaces where bushes should stand. I plant Black-Caps six feet by four, plow them one way, and hoe between the bushes. After the first year nip the tops of the young canes when they are two or three feet high. Unless you have stout, thrifty, broad-topped bushes you cannot have a large yield. I plant the red varieties the same distance apart and let them spread along the rows hedge-fashion. The Turners will keep down all weeds in the rows as soon as they get a full stand. They sucker tremeneously, but the plow will keep them down between the rows. If they become too thick, run the plow a little closer on each side of the row and destroy part of them; but you must have a tolerably broad and continuous row to get the largest yield. Cultivate early in the spring, and cultivate as soon as the fruit is gathered. You are not likely to cultivate too much. Mulching is a good thing, but it may be overdone. Thorough and frequent cultivation is better than mulching, in my opinion.

Pruning—Marketing.

It may be best to cut out the old canes as soon as the fruit comes off, but I leave them till spring, when I cut them out and remove them, and also all dead branches and tips of the canes.

Even the Turner berries we haul to Stillwater, ten miles, and to St. Paul, fifteen miles, on a common spring wagon, without much jamming, notwithstanding that our quart boxes hold a lawful quart, dry measure—sixty-seven and one fifth cubic inches, each. Let us drive out the swindling boxes sent here with berries from other States.

I repeat that the best care and most thorough culture will pay the best, and poor culture will not pay at all

J. W. BOXELL.

DISCUSSION.

Mr. Brimhall moved that the paper be accepted and placed on file for publication, which motion was carried, and the subject declared open to discussion.

Varieties.

The *Secretary*. Are the distances named good ones, and is the method of matted rows described a good one for the Turner?

Mr. Fuller. That is the way I cultivate the Turner. Prefer the Turner to the Philadelphia. The canes are stronger and more vigorous. Can't do much with Black Caps. The Doolittle is the only one I can do anything with.

Mr. Harris. The Seneca is more hardy than the Doolittle. The distance is all right for the red varieties. Seven or eight feet is better for the Black Caps. Would like to hear concerning the new varieties if any here have tried them.

President Grimes. Have tried the Highland Hardy for a year or two. It is not satisfactory. It suckers badly.

Mr. Brimhall. The Turner I have cultivated in rows and in hills both, and I like rows best. It is less work and gives a better yield. Should keep the weaker canes cut out and the stronger ones pinched back. I cultivate the Philadelphia in the same way. The Philadelphia yields better, has a harder berry and keeps better, but is not so good in quality. On the whole the Turner is most profitable to grow. Have discarded the Black-Caps. They are not profitable, when we can get so much better price for the Reds. The grass gets into the hills of the Black-Caps and it is difficult to get it out. No such trouble with the red varieties.

Mr. Jordon. I have 20 acres of raspberries, of which 15 are in

Black-Caps. The Doolittle is the only profitable one. I get more money from the Black-Caps than from the Reds. It costs less to pick them; they bear shipping farther and keep longer. I can get no better price for red raspberries. My land is high, clay, limestone soil. I plant the distance named in the paper—6 feet by 4.

Soil, Varieties, Pruning.

Mr. Fish. Do raspberries do well on sandy land?

Mr. Cook. They do; especially the red varieties and the Turner especially. The Philadelphia needs very thorough cultivation, liberal manuring, and then it exceeds the Turner, but the Turner is a better berry for home use. I have not found the Doolittle hardier than the Mammoth Cluster. Location and surroundings are to be considered. It is a good plan to plant among orchard trees while these are young. Black-Caps do better there because of the protection which they need more than the Reds. It is a question if the Black-Caps pay in open field culture. Their hardiness depends also on mode of pruning. The Black-Caps the first year I cut back to one foot, and the second year to two feet, or even less. Then they branch out laterally and are covered by the snow, when there is any. I would say plant them two feet apart in the row—not more than three feet at any rate. Thus planted and pruned they form matted row.

Raspberries among Orchard Trees.

Mr. Eldridge, of Excelsior. Do you plant in the neighborhood of the trees or only between the rows.

Mr. Cook. Both.

Mr. Eldridge. I have done so but contemplate taking out the plants as they interfere with the trees. I prune to 3½ to 4 feet high. I have an eastern exposure and a strong clay soil. Have no trouble with killing off the vines.

Mr. Cook. Davison's Thornless I consider tender and worthless.

Mr. Jordon. Have planted Davison's Thornless on two farms and have not obtained a quart of fruit, but other parties recommended it as being hardy. Have had the Mammoth Cluster and that is entirely tender and worthless.

Mr. Harris. Planting raspberries in orchards is good or bad according to the grower. Where they are not kept clean they encourage mice and rabbits, and I shall abandon that method.

They also exhaust the moisture of the soil during the winter and thus contribute to winter killing of the trees.

Mr. Jordon. I agree to that, but if you want fruit from both trees and vines and give good culture, nothing is better than to plant both together. When the trees come into bearing cut out the raspberries.

Mr. Harris. Growing turnips or potatoes in the orchard is better. You cease to cultivate them before it gets late in the season, and do not encourage a late growth.

Mr. Cook. I do not recommend cultivating thistles and weeds. The raspberry vines also prevent injury to the trunks of the trees by the sun on the south side. They hold the snow and prevent root-killing. They yield a profit that pays for the trees and cultivation both. I give up the raspberries, however, when the trees come into bearing. There is no danger from mice if the raspberries are not planted too close to the trees.

Mr. Dart. My hobby for a young orchard is to plant corn. Husk standing and leave the stalks to hold the snow. It is a prime necessity to mulch the trees to insure against root-killing. Mulching is the only sure security. Grass sod and raspberry vines might, however, help.

Rust.

Mr. Harris. Is there any remedy for the "red rust" mentioned? The Doolittle is a failure because of this with us.

Mr. Cook. Purdy says ashes around the bushes and sprinkled on the leaves when they are moist.

Raspberries for a Family.

Secretary. What area or how many feet of row should be necessary to supply a family of five to ten persons?

Mr. Jordon. I would want ½ acre; though from this I have sold $120.00 worth of fruit, besides canning and using fresh.

Mr. Harris. I would use the fruit from ¼ acre of Black Caps and 50 to 75 bushes of the red varieties.

Mr. Clark. I keep about ¼ acre in raspberries for a family of 10 persons. I agree with Mr. Jordon in clean and thorough cultivation. No small fruit requires so much and thorough cultivation as raspberries. Am surprised that nothing has been said concerning the Orange or Yellow Raspberry. I get more and better fruit from it than from any other. The old Purple Cane, under the best cultivation, gives as much fruit as the Turner

or Philadelphia. As to cultivation in young orchards, don't plant within 8 feet of the trees and thus the vines get no shade, but the best berries grow where they get a little shade. Probably we must go to work with our soils and conditions and each ascertain for himself what varieties will do the best. Planting in orchard depends also on distance of trees. I planted my first trees 16 feet each way. Now I plant 32 feet apart.

Dr. Twitchell. I plant 8 feet apart each way.

Mr. Jordon. It is not best to have the raspberry bushes 4, 6 or 8 feet from the trees. I plant two feet from the trees and have trouble with mice. I clean away the grass and mound up around the trunk in the fall.

Mr. Gibbs. How much later is the Turner than the Philadelphia?

Mr. Fuller. There is but little difference; the Philadelphia if anything is the later.

Mr. Gibbs. It has been claimed that the Turner is the later, and I have seen the fruit on the bush in October.

Mr. Harris. The Turner has a longer season, inasmuch as it can be picked a week earlier and a week later than the Philadelphia.

Mr. Mathews, of Big Stone County. In 1874 I got plants from the woods for one-eighth of an acre, and in 1875 I got Davison's Thornless and a yellow variety. The latter produce strong and vigorous, but the wild ones have given more berries. Mr. Hollister, who saw them, said that the wild ones were regular Black-Caps, the seeds of which must have been carried there by birds. One-half acre I have not found too much for a family. The Philadelphia is not satisfactory to me. It spreads too much. Mine is sandy bottom land on Big Stone Lake. Davison's Thornless and the yellow varieties have stood the winters well.

Davison's Thornless.

Mr. Jordon. Am satisfied that there are two varieties called Davison's Thornless,—one tender and the other hardy.

Mr. Sias. My soil and location are like Mr. Jordon's, apparently; but a little difference in location makes a great difference in hardiness. My experience with Thornless differs from Mr. Jordon's, and the fact is due to difference in location. I don't believe in there being two varieties under this name.

Mr. Dart. I fear the effect of telling of these perfect successes with raspberries. Believe locality is everything. Think these

locations were the very best. Know of several cases in which there has been failure, and think it will be the result in many other cases. They will probably get some fruit one year in three.

Mr. Harris moved that the discussion on raspberries close, which motion was carried, and the Society then adjourned to meet at 1.30 P. M.

TUESDAY AFTERNOON.

MR. BRIMHALL'S REPORT.

The society was called to order by the President, when Wm. E. Brimhall, of St. Paul, read his report on Orchards for Profit.

The paper was accepted and filed for publication, and was as follows:

"ORCHARDS FOR PROFIT."

Mr. President and Gentlemen:

The paper which I have the honor to submit, in response to the invitation of your Secretary, contains only such facts and deductions from my own experience as seem to me most important in a discussion of this topic.

Making no claims to extended or critical scientific knowledge of the subject, my only purpose is to present a plain and practical statement of my own experiments in this direction, and add such suggestions as I deem the most valuable in creating a healthy and correct sentiment in relation to this important branch of industry in our midst.

Future of Fruit Culture.

That the cultivation and production of fruit is to be one of our most important and lucrative industries, I make no doubt. That fruit can be produced here is no longer a matter of speculation, but an assured fact.

So clearly has this fact been demonstrated that there should no longer be any hesitation on the part of agriculturists in embarking in this industry to the full extent of their opportunity. The value of fruit as a common article of food, at once nutritious and healthful, is coming more and more to be understood and appreciated. And since the cost of production is so comparatively light, it is a matter of surprise that men, who have good facilities, do not produce enough at least for their own consumption.

And I am confident that the demand will exceed the supply for a long time to come. It is an old tradition that in Spain, when a person eats fruit of any kind, he immediately deposits the seed in the ground.

The consequence is that the highways, in that favored climate, are lined with fruit-bearing trees, and the wayfarer is gladdened by the beauty and

fragrance of their blossoms and perfume, and refreshed by the richness and delicacy of the ripened fruit.

The tradition should furnish us a hint of what is possible and practicable whenever the conditions for fruit growing are favorable.

By acting on this hint this luxury may be brought within the reach of all of us, and as it enters more and more into the list of our articles of diet the health of our people will be promoted.

Attraction of Fruit Culture.

I have not time to speak of the attractions which this branch of industry possesses, nor of its importance as furnishing a field for the exercise and gratification of our higher tastes, and the nurture and growth of elevated and refined sentiments. It is enough to say that there is no department of labor that furnishes such rare and noble attractions, and none that yield larger harvests of satisfaction and enjoyment, since it puts one so constantly and directly in contact with the hardiest forms of nature, and in the most intimate relations with her most marvelous laws and methods.

This phase of the subject is exceedingly attractive, but the purpose of this discussion forbids that I should linger on it, but proceed at once to consider the economic side of the question.

"My Orchard"—Extent, Soil, Varieties, &c.

My orchard consists of twenty acres, originally an oak opening. The surface is slightly rolling, sloping in some parts to the east and south but with a general western slope. The soil is a rich loam, with clayey wet soil. One half the orchard, the north ten acres, was planted in the spring of 1872.

The trees were set twelve feet apart each way, with a row of Scotch Pines on the north and east sides. The varieties planted at that time consisted of the following: Transcendent, Hyslop, Montreal Beauty and Wax, Virginia, Orange, Quaker Beauty, Duchess, Tetofsky, Haas, St. Lawrence, and Alexander.

Since the original planting to replace those which failed for any cause, the Wealthy has been planted.

The other half, the south ten acres, was planted in the spring of 1873. The trees were the Transcendent and Hyslop Crab varieties, and were set twenty-four feet apart each way. During the first four years the entire orchard was under cultivation with hoed crops. Since then seven acres have been seeded to clover, and the balance cultivated as before. About five acres are in Turner Raspberries and Wilson Strawberries. In addition to this there have been cultivated in this orchard forty thousand seedling maples, three thousand elms, now two years transplanted, one thousand small evergreens, two thousand currant bushes, now two years old, and eight acres of corn.

It is quite noticeable that the trees in the cultivated part of the orchard bear much more fruit than those in the clover field, showing conclusively that thorough cultivation of the soil is a great advantage to the trees, increasing the quantity and improving the quality of the fruit.

Varieties to Plant.

With the experience gained during these few years I am able to give a more pronounced judgement in regard to the comparative value of the several varieties named: and were I to plant another orchard of the same magnitude as the one now under cultivation, I should select as follows:

Wealthy	Ten acres.
Duchess	Eight acres.
Tetofsky	One-half acre.
Haas	One-half acre.
Transcendent	One-fourth acre.
Hyslop	One-fourth acre.
Virginia	One-fourth acre.
Orange	One-fourth acre.

Picking and Handling Fruit.

Great care should be exercised in picking and handling the fruit. The condition of the fruit when marketed will largely determine the price. It should be carefully picked and put in the baskets or boxes, in which it is to be sent to market, and none but *sound* fruit, or fruit free from bruises and soft places should be offered for sale. In this way a demand can be created and maintained for the best fruit, and at remunerative prices.

Pecuniary Results.

In considering the results of these experiments, it should be borne in mind that many of the trees are of small size, and produced but little fruit. Many of the larger trees produced from two to four bushels each. Had the entire orchard produced accordingly, the profit would have been correspondingly larger. On an average of two bushels to a tree, and seventy trees to an acre, the result would have been 140 bushels to the acre, which, at $1.50 per bushel, would have yielded a return of $315 per acre.

The following figures will show the result of last year's production. The first fruit was marketed July 12th, when twenty bushels, consisting of windfalls and fruit picked to relieve overbended branches, were sold at 80c. per bushel $16.00

240 bushels of Duchess on ½ acre, from 150 trees	$370.00	
Total on one-half acre		$386.00
30 bushels, mostly Haas	$45.00	
547 bushels crab-apples, all varieties	351.40	
		$396.40
300 quarts raspberries at 15c. per qt	$45.00	
260 quarts strawberries at 10c. per qt	26.00	
		71.00
Total for fruit		$853.40

There were also sold from the same fields:

3,000 raspberry plants, at $5 per M	$15.00
12,000 strawberry plants at $4 per M	48.00
Total	$63.00

There were harvested from the same fields:

12 tons hay	$72.00
240 bushels corn	96.00
12 loads corn fodder	24.00
Total	$192.00

The young trees on the ground are estimated as follows:

40 000 maple seedlings	$100.00
Increased value of 3,000 elms	75.00
2,000 currants	45.00
1,000 evergreens	20.00
Total	$240.09

Summary.

Fruit	$853.40
Plants sold	63.00
Corn, hay, etc	192.00
Growth of plants and trees	240.00
Total	$1,348.40

Duchess and Wealthy.—Distance.

The Duchess has been the most extensively cultivated in this vicinity, and has proved to be the hardiest tree, and, in my judgment is the most profitable variety. Although I have raised of the Plum Cider variety eight bushels to a tree, yet its cultivation has been discontinued, and it is no longer regarded with favor.

I regard the Duchess and Wealthy as in all respects the most reliable varieties, and think they can be planted with safety.

They should be set at least twenty-four feet apart both ways. The land should be kept under good cultivation, with crops that require frequent hoeing.

A distance of 24 feet between the trees will allow of thorough plowing and cultivating, and give ample room for fair crops every year, and at the same time the trees will be more healthy and vigorous, and the fruit of a correspondingly superior quality. The contrast between fruit grown in dense thickets, and in orchards where the trees are planted 24 feet apart, from which sunlight and air are not excluded, is so marked as to become apparent to any one, both in respect to color and flavor.

And fruit produced under these more favorable circumstances is sure to command a better price in the market, and to be in constant demand. Such

highly colored and flavored fruit, harvested at its full maturity, carefully picked, free from blemishes and bruises, in clean baskets, and transported to market in a spring wagon, will command a ready sale, and at remunerative prices. In my experience the supply has never exceeded the demand.

Over-production

And there is little danger that in the future, fruit growing will be carried to excess. It is a fact that at present fruit is one of our principal imports, and from the fact that much of the earlier fruit, and all the small fruit is picked and shipped before its maturity, to say nothing of the injury which it receives in transit, it will be seen that when it reaches the consumer it is of an inferior quality, and much of it possibly unfit for use.

One has only to inspect the fruit on sale in the jobbing houses of our cities, or sold in large quantities at auction houses, to be convinced of this. The moral is this: That we should produce all the fruit necessary for home consumption so far as we are able to do it, and so far as the conditions of our climate are favorable.

In this way we shall retain at home a large amount which is now sent abroad for fruit which could just as well be produced here. And more than this, in the case of some varieties of fruit, we can create a demand for abroad. It would not be a surprise if in some fruits we should excel our neighbors, and that we, by Minnesota fruit, will have a reputation as high as Minnesota wheat and flour.

Conclusion.

In conclusion allow me to remark that my experiments in fruit culture have not engaged my special attention, nor have they absolved much of my time. This branch of industry has rather been an incidental one with me. I have bestowed less attention to this department than to any other. If any part of my business has been neglected it has been this. The results of my experiments, therefore, furnish no correct data for forming a correct judgment of what is possible to be done in this branch of industry.

But enough has been realized to convince me that it may be made not only a remunerative industry, but one that possesses rare attractions, and corresponding enjoyments.

Very respectfully yours,

W. E. BRIMHALL.

DISCUSSION.

The paper was declared open for discussion, and the following remarks were offered.

Varieties.

Mr. Harris. Think the paper is a good and practical one. Think some varieties are cultivated with profit by some persons, but thousands of dollars are sunk in fruit trees. A Wisconsin friend told me he would plant 999 Duchess of Oldenburg and one

Duchess in every thousand trees. I would plant in the same proportion in this State. Think Mr. Brimhall's figures are very low. If the land is not too steep, it is much better to cultivate the orchard than to let it run wild.

Blight.

The *Secretary* would like to ask Mr. Brimhall whether he was troubled with the blight; and on which most, the part cultivated or the part in grass?

Mr. Brimhall. The Transcendent blights worse than the other crab varieties; it colors more finely where cultivated than on clover sod.

Fruit Growing a Profession.

Mr. Pearce. Think one-half of the fruit raising is a failure, and yet Minnesota can raise and ship thousands of barrels of apples. Why? Because fruit raising depends upon the soil, attention, and cultivation—general management. My conclusion is that apple raising is a profession which some persons can pursue with success while others fail. It has been proved beyond a doubt, in the last 25 years, we can raise some varieties of apples in Minnesota.

Set fruit trees; be careful what you set; and take good care of your orchard. A few persons are going to make money with their orchards. One who intends to set trees must consider his soil as to moisture, composition, locality, and liability to frost. We have localities good for several varieties. The Duchess is the variety for the most.

Mr. Brimhall moved that each person be limited to minutes during the discussion, and be allowed to speak but once, except to answer questions.

The motion was seconded and carried.

Winter Killing.

Mr. Day. Would ask Mr. Brimhall whether he lost any trees by winter killing, and whether the cultivated were more liable to winter kill than the uncultivated.

Mr. Brimhall. The uncultivated were more liable to winter kill.

Mr. Day. I lost a good share of mine in the winter of '72 and '3, and they were cultivated. My brother's trees that were not

cultivated lived. More cultivated than uncultivated trees were killed that winter.

Mr. Brimhall. My uncultivated Duchess of Oldenburg were more injured than the cultivated ones, but the cultivated trees give larger fruit.

Mr. Jordon. There is evidence in Mr. Brimhall's paper that fruit can be grown with profit. I am satisfied of this.

The mass of the people in Illinois do not possess orchards. Fifteen years ago I planted an orchard in Illinois. Last year I visited the place and not a tree was living. They had not been cultivated. One man there has yet an orchard, and he cultivates it. My Duchess of Oldenburg found a ready market at $1.50 a bushel, while the smaller apples at half this price were left on my hands. The Duchess and Wealthy are the hardiest varieties. We want to cultivate our trees. Plant deep to avoid root-killing.

Distance--Apples at a Profit.

Mr. Dart. Think 24 feet apart is too much. I plant mine 16 feet apart—20 at the outside—and consider that enough. Our trees will be short-lived, and we must be constantly replanting. In Wisconsin orchards tumble down when about 25 years old. Apples are grown at a profit in many instances. Have raised the Tetofsky at a profit. Don't believe it requires a professional pomologist to grow fruit. There are a few essential points, and if they are complied with success is insured. A high, dry location with a free circulation of air, cultivation and preparation for the winter, and hardy varieties, are essentials.

Mr. Fuller. Think I have as barren a location as any one in the State. A light, sandy, gravelly, subsoil, a very light sandy loam. Am satisfied with my fruit-growing. Have several Duchess and a few Tetofskies. Took great pains with them. Manure heavily and plant very many evergreens between my fruit trees. Success depends more upon care in cultivation than upon anything else. For small fruits my soil is better. Currants bear well; I never saw finer bushes, and found no difficulty in disposing of them at $3 a bushel.

Mr. Eldridge. My soil is a very strong, stiff clay, and faces east. Portions of it are so steep that I had to sow it with timothy. Set out some trees that I had bought in E. St. Paul in '68. From six Hass I gathered nine bushels. These were killed in winter of '72-3. Planted seven Duchess at the same time and some Plumb's Cider also. Planted these 12 feet apart, and now they cover the

ground. The balance of my trees were set out 20 by 30 feet apart. In the former the fruit on the inside does not ripen, but on the east side is my garden, and there the fruit is large and turns a fine red. The fruit on the inside remains green and falls more than that on outside. Where I planted my trees 20 by 30 all the fruit ripens. These seven Duchess have been in grass the last four years because they were too close to be cultivated. Think the Wealthy will be the apple for Minnesota; it is better for keeping. The Duchess soon becomes mealy, and is too tender. I have a winter apple that keeps well in barrels till April. Do not know the name of it. The tree is not extra hardy, and is grafted on a Hyslop stock. Like it well.

Soil for Apple Trees.

Dr. Twitchell. What is the right kind of soil? On what kind of soil do trees die soonest?

Mr. Harris. An unfavorable soil is a wet, mucky soil, and its effects will be seen the first year. If the soil is all right, the fruit will prosper. Would call a sandy loam, containing lime—a loam not so tenacious as to hold water for several weeks in a post-hole, but that would let the water soak through in about forty-eight hours—a good soil. River deposits are not very good for a tree. Genuine loamy clay soil, not too stiff, is the best. For general fruit raising, good wheat and corn land is good. Clay with a northeast slope will also do.

Mr. Fuller. Any new land is good wheat or corn land in one year, but it is not so with fruit trees. New land does not seem to be favorable to them until cultivated for several years. Clay sub-soil is the best, but I think there is not much difference in the soil. A friend of mine has in good condition the Duchess and Hyslop in sandy soil, planted ten years ago. Some of my best trees are planted in a sandy loam, and I have some on other ground. Find that those planted in a sandy soil stand as much freezing as those planted in other soils. We must mulch our trees.

Lime.

Mr. Storrs. Fruit trees must have lime to make them strong. In a heavy clay soil fruit prospers well because there is enough lime there.

The Secretary. Lime is not a food question to the tree; but it seems to me it produces its effect by acting upon other substances in the soil. There is lime enough in any soil for food to the tree.

Mr. Pearce. I agree with the Secretary, and think if in many cases there were less lime, it would be better. The sap is taken up by the roots in a crude state, and too much lime would hinder the flow of the sap.

Mr. Storrs. Those trees around which I put much lime stand the winter best, and are thriftier than those around which I put none. I have also used wood ashes. Have read in a scientific paper that about twenty-five per cent. of the apple tree wood is lime. If this statement is true, then trees need lime for food.

Mr. Fish. The old adage says, "Lime enriches the father but impoverishes the son." The latent virtues of very poor soil may be brought out by lime, but the lime is not the food of the tree.

Mr. Fuller. Would like to ask Mr. Storrs whether he put his ashes and lime around the same kind of tree?

Mr. Storrs. No.

The Secretary. Mr. Fish is right. The lime produces its effects through some means other than the direct supply of food. We can easily see that a tree cannot contain twenty-five per cent. of lime. So much lime would make the wood of the apple tree brittle. Five to six per cent of the wood, perhaps is ash. Of this twenty-five per cent. may be lime, but this would make the lime only about 1½ per cent. of the entire wood.

Mr. Brimhall. As to how long it takes to find out what kind of trees will succeed on certain soils, much depends on the season. One severe winter, with the trees not mulched, would tell the story. The crab varieties grow on most any kind of soil. Heavy soil is the standard requisite.

Mr. Eldridge. Is mulching preventive of top-killing?

Mr. Brimhall. I think not.

A Member. A proper choice of soil is.

Mr. Eldridge. The ground on my farm is full of lime, and persons have remarked that my orchard is as healthy a one as they ever saw.

Theory of Winter-killing.

Mr. Dart. Think extreme freezing does not kill as much as thawing. If the frost is drawn out gradually it is much better for the trees than when it is suddenly drawn out. It is more suddenly drawn out on southern slopes. A high land exposed to the north, with a good circulation of air, will prevent sudden thawing. Trees are many times killed just at the snow-line, while the top and roots are good. The snow reflects the heat of the sun against the tree at the snow-line and thaws the tree

there, while the top and roots have a continuous cold temperature. The dead ring on evergreens and other low bushes is due to this. Low plants are killed at the top from the same cause.

Mr. Jordon. Theories do not always agree with practice. I had some land with a high northern slope, protected by timber, and on this my fruit did very good, while the trees on a slope about 100 feet down (comparatively low land) was badly injured. On the low place the wood of Duchess was badly colored. From this it appears that high, elevated land is the best.

Dr. Twitchell. Think it is the thawing out and not the freezing that kills the trees. I agree with Mr. Dart. This is a fact in the animal kingdom, and I believe it is one in the vegetable kingdom.

Mr. Pearce. Have no fear of winter-killing. If I can save a tree in the fall, I can pretty certainly say whether it will stand the winter. In the winter of '72 and '3 over a thousand trees were killed where the ground was never frozen. Part of my land was planted in potatoes, and they grew in the spring. The winter was open and snow came early. The early snow kept the ground too warm; the sap began to flow, was frozen, and ruptured every root. If the ground is dry and the trees thaw out in dry ground, they kill. The ground should be mulched when too dry. Protection in the fall is the secret.

Mr. Day. I agree with Mr. Pearce. In the spring of '73 I dug potatoes as good as those I dug in the fall. In the spring of '69 my trees were killed in a similar manner.

Mr. Harris. No snow on the ground and the frost penetrating many feet into it is what kills the trees.

Mr. Jordon. I agree with Mr. Harris. Excessive hard freezing with no snow kills the trees. The less the frost in and above the ground, the less is the number of killed trees.

Dr. Twitchell. Couldn't find an unfrozen potato on my land when the trees killed.

Mr. Cook. Had 5,000 trees killed. Would ask *when* were they killed? They were root-killed. I mulched two portions of my orchard, and one I did not mulch. The portion that I mulched early, before the first frost set in, was saved, while the portion mulched after the first frost was as dead as that portion not all mulched.

Mr. Fuller. The hard freezing in December before the snow comes, kills my trees.

Mr. Eldridge. Every one of my trees ruptured and split above ground, and yet they sprouted up from the roots.

Mr. Brimhall. Cut various scions from mine in winter of '72 and '73 and found the wood of all colored. The cold winter had killed them. The same may be the case this winter—40° is what more or less injures the trees.

Mr. Gibbs. A farmer, Thomas Mateer, of Glasgow, Wabasha Co., has a Duchess of Oldenburg, planted 18 years ago last spring, that produced 25 bushels of apples last year, and altogether has yielded him over 100 bushels. The tree is yet perfectly healthy. Mr. Mateer has an Alexander tree of same age that is an annual and abundant bearer, and it is also in a thrifty condition. These are supposed to be the two best apple trees in the State. Location in a valley with southeast exposure. Soil, sandy loam in clay subsoil.

Prevention of Winter Killing.

Mr. Eldridge. How can we prevent this early or late flow of sap, freezing and bursting of cells?

Mr. Pearce. Plant on high, dry ground.

Mr. Jordon. My trees were cultivated late, and any tree that grows late in the winter is liable to be killed.

Untried Varieties at Fancy Prices.

Mr. Harris. I move the adoption of the following:

Resolved, That it is not policy for the people of Minnesota to purchase untried varieties of fruits and plants at fancy prices.

The resolution was seconded.

The *Secretary* suggested that this called up difficult questions as to what are untried varieties and what are fancy prices? Would like to have the action of other societies on this subject consulted. Did not think much good would be effected by the resolution in this shape.

Mr. Dart. See no reasons against its adoption. But what reasons have we for it? One good reason is that there is swindling carried on among our farmers by parties that sell fruits worthless for this part of the country at enormous prices. Many of our best men are fooled.

The *Secretary* would like to hear from some who have had some experience with these swindlers. Had a talk with one, but I was not induced to purchase. But if I had been less informed than I

am, I should have bought some. The man was a very smooth talker.

Mr. Jordon. They have been at me, but I saw through the swindle and would not buy. Many cannot distinguish certain wild plants from tame ones. Some are unable to tell a wild goose plum twig from a peach twig, and hence are easily duped. These swindlers are way ahead of us western men. We are too slow in canvassing, and might perhaps diminish the evil by more activity in this respect.

Mr. Brimhall. Cautions and resolutions will do no good. The people want to be swindled.

Mr. Probstfield. Swindlers have tried me, and it was hard for me to say no. Mr. Probstfield told the story about one that wanted to sell him a Lady Grape. The canvasser showed him a photograph of the vine climbing on the side of a house near the window, but the vine was too thick for Mr. Probstfield. And when the agent was reminded of the fact that a vine growing near a window, and so young, couldn't be as thick as his two thumbs, he insisted upon that one being so good and strong.

Mr. Pearce. These agents have taken $30,000 out of this State for the Emperor of Russia—said to be one of the best winter apples,—for the Beecher Sweet, Utah Plum, and some others. One man paid $60 for Utah Plum trees, which are nothing but a California shrub. But I am glad these agents did this work. They have educated our farmers.

Mr. Probstfield. This resolution will do no good. The people want to be swindled. I know men I can sell anything to, if I only talk. I could make them buy an elephant, though they had no use for it.

Mr. Day. Believe these resolutions will do some good. These persons wanted to sell me some plants, and had it not been for the resolutions and transactions of this society I would have bought some. These transactions do reach some farmers and put them on their guard.

Mr. Fish. Think the best thing to be done is to publish the salient points of these discussions in our local papers.

Winter Killing Again.

Mr. Day. Would like to return to the former subject. My brother's trees were in grass, and did not kill. Mine were not root-killed, but the bark split open. If the early freezing was the cause the potatoes ought to have frozen.

Mr. Probstfield. In the spring of '73 my trees, planted in cultivated ground on the south side, were killed, while those undersod on not cultivated ground, were not hurt much.

Mr. Dart. Do you think the sod is a good protection?

Mr. Probstfield. I have no theory to offer on it

The Secretary. Think there is a wrong expression in vogue among us that ought to be rectified. It is said that the sap is going to the roots when a tree is ripening. This is not the case. The sap evaporates through the leaves and the bark on the young twigs. It is very unnatural for the sap to go back whence it came.

On motion, the discussion was closed.

METHODS OF PRESERVING FRUITS.

It was moved and seconded to hear Col. Steven's paper on the Catalpa in Minnesota, but the Colonel not being prepared, it was deferred till to-morrow.

Mr. Jordon. I move that we take up for discussion Methods of Preserving Fruits. The motion was seconded and carried.

Mr. Elliot. (In response to a call.) In gathering fruit it is best to take it when it is just coming to maturity, wrap in paper or not, and then place in a cellar of an even, cool temperature. You can pack apples in cork sawdust or anything that will not heat, or in ice. Packing in ice requires great care.

The Secretary. Would ordinary sawdust answer the purpose?

Mr. Elliot. Think it will do, but cork sawdust is the best. Batting is also good for packing. Also, Plaster of Paris, and dry and fine sand. In California where the climate is warm no cellars are used, since they are warmer than the surface, and the fruit is buried in sand banks, where it keeps well.

The Secretary. Will land plaster do as well as Plaster of Paris?

Mr. Day. Does not the Plaster of Paris give its taste to the fruit?

Mr. Elliot. I think not.

Mr. Eldridge. What temperature is the best?

Mr. Elliott. The Duchess keeps well at 35°. I find a low temperature is good for most all of the varieties. Pack about three tiers deep. You can freeze russets and keep them in a cool, dark cellar till May, but they must be thawed in a cool, dark place. If used up immediately they are good. The Baldwin and others of this class are injured too much by freezing.

MARKETING APPLES.

Mr. Eldridge. Would like to hear something about marketing apples.

Mr. Elliot. Think the best way is to put the fruit in bushel baskets and take about 30 baskets for a wagon load. Mr. Brimhall handles his apples very well this way, and the people are greatly satisfied with them. Always give good measure. The only trouble is the tradesmen sometimes rehandle the fruit and increase the number of measures. Think the true way to handle fruit is by weight. In measuring it, the fruit has to be handled too much. Farmers often bring their fruit in bags; then it has to be measured and then put away. Much handling bruises the fruit too much.

Mr. Gibbs. Mr. William Duffers, of West Albany, Wabasha county, is very successful in showing the Duchess apple at the late fall fairs. His method of keeping them is to tie up his samples in rags while on the trees, leaving them to hang there till wanted.

PRESERVING FRUITS RESUMED.

Mr. Jordon. My apples in the Centennial liquid preservative keep indefinitely. Will explain it soon. Pack your apples dry and keep them cool. Do not barrel up the apples; the sweat gives them black spots. Dry sand is good. Thoroughly seasoned saw-dust will do. Pine saw-dust gives the apples a taste of pine unless you expose them for a time after taking them out. Dry sand is probably better than saw-dust, if it is as cheap. The Centennial process consists in exposing the fruit to the fumes of sulphur for some time, and then place in water also impregnated with sulphur fumes. This process spoils the taste; it takes all the taste out of the fruit. It is good only for preserving for exhibition.

Mr. Woods, of River Falls, Wis. My experience is that apples are injured more the first five or six weeks after they are gathered than at any other time. You don't want to put them in a cellar; nothing can keep the dampness out of that. I have the best success in packing them by hand, when dry, in barrels, leaving air spaces at each end. Then put them in the north side of your building, away from the sun, until it gets too cold, when remove them into a cool, dry celler till spring. I gathered a part of my fruit and put it away in my chamber. They became damp before

spring and rotted. Had too barrels of Willow Twigs packed away by the first process, which in April contained only two specked apples; they looked as fresh as when taken off the tree.

Mr. Jordon. Have packed them in saw-dust and placed them in a damp cellar, and the saw-dust did not take up the moisture of the cellar, but it took up only that of the apples.

Mr. Harris. Believe flax would be good for keeping apples fresh and cool.

Mr. Jordon. How would chaff do?

Pres. Grimes. Does it not get musty too quick?

Mr. Eldridge. Chaff wouldn't do.

Mr. Brimhall. Have kept apples in land plaster.

Mr. Jordon. Would like to ask whether any one has tried these underground cellars made by digging into the bluffs.

Mr. Tyler. The whole question centers on temperature. Sand is the best to pack in.

Mr. Woods. Underground cellars are good for potatoes, but not for apples.

Mr. Day. This last statement is correct. Saw Duchess kept on ice in a very good condition.

Secretary. Think success depends not only upon the temperature, but also upon moisture and air. Secure a low temperature and dryness, and you will succeed as well as by employing some packing process. Exclusion of air is a principle of the patent packing process. Destruction of germs is also a principle. The sulphur fumes of Mr. Jordon's process replace the air and moisture in the pores of the apples, and so preserve them.

Mr. Pearce. Pick the apples when dry, put them in a room and wipe after sweating; then barrel and place in a cool cellar, or put on shelves where there is a circulation of air. Apples must not be bruised.

Mr. Harris. Would not place them in a current of air. Had a barrel of apples stored away near a window, where the air circulated, and I had one in a back corner in my cellar. Half of those at the window rotted, and only three or four of those in the corner.

Secretary. In Western New York probably as many put them in barrels, head them up, and store away in a cool cellar, as pursue any other method.

A motion to close the discussion was carried.

APPOINTMENT OF COMMITTEES.

It was suggested that the committees be appointed, and after some remarks by the Secretary in regard to overburdening some members with committee duties, the following appointments were made:

Committee on Articles on Exhibition: E. H. S. Dart, A. W. Sias, M. I. Mathews.

Auditing Committee: J. S. Harris, A. Morse, Ditus Day.

Committee on Final Resolutions: G. W. Fuler, O. Gibbs, Jr., G. H. Fish.

SWINDLING TREE AGENTS.

The discussion of this subject was resumed.

Mr. Harris. The resolution was offered to draw out discussion. It has been of great service to me; and I am in favor of passing some such resolution as that offered.

Mr. Storrs. An Ohio agent wanted to sell me trees not long ago, telling me what an excellent tree it was. I asked him why it was that our Horticultural Society did not know it or say anything about it. After I tried to get him mad I was swindled into buying $2.50 worth of the Russian Emperor, Rubicon, and Utah Hibrid Cherry.

Mr. Emery. Think our nurserymen are to blame a good deal for this swindling. They have not held their own ground in canvassing.

Mr. Sias. The nurserymen have not done their duty, but they could not remedy the matter entirely. Mr. Sias told of a man that would not pay for trees bought of a home nurseryman, saying he had not received them. The matter went to court, and was decided against him; and the man, to show his respect for the nurseries at home, bought $300.00 worth of these agents. Now he has nothing to show for his money.

Mr. Dart. Seems to me this matter is rather lightly treated. This is really obtaining money under false pretenses, and the penitentiary is the place for such swindlers. As to reaching the masses with these resolutions, I say we will not; they are already reached. Don't believe the nurserymen are to be blamed.

Mr. Woods. Most agents go to the farmers when they are busy, and gain by it. Was swindled out of $22.50 for "excellent" trees, and have one "pie-plant" left. I had plenty of good company. The fact is, few farmers know much about fruit. It will be impossible to swindle me again with new trees.

Mr. Storrs. Not one of those I bought came through the winter when we had 34°.

Secretary. Do not think it quite correct to say we are locking the door when the horse is stolen, because these agents are still at work. And I do not think, either, that the nurserymen are responsible for this evil, but I think they could diminish the humbug greatly by canvassing themselves

COMMITTEE ON UNTRIED VARIETIES.

Mr. Dart. Move that this resolution be referred to committee of three, appointed by the chair.

The motion was seconded and carried, and Messrs. Harris, Dart, and Jordon appointed as such committee.

Mr. Gibbs. Think we ought to devise some plan of action. Our resolutions don't go far enough. We ought to have a more general distribution of the facts through the State in the press.

Motion to adjourn till 7 P. M. was carried.

TUESDAY EVENING.

The meeting was called to order by President Grimes at 7:30 o'clock. The Secretary read the following letters, which were ordered filed for publication.

LETTER FROM JOHN HART.

WATERTOWN, D. T., Jan. 6th, 1880.

Prof. C. Y. Lacy,—

DEAR SIR:—Your card of Dec. 2nd, has been forwarded to us from Winona to Watertown, our present home. We assure you if we could give you anything that would be of benefit to your society or the people of Minnesota, we would cheerfully do so.

We shall always remember the State Horticulturist Society, and I assure you, sir, we feel sorry that we can not attend your winter meeting.

We are now in a new field of operation and nearly due west of Minneapolis, in a country without a bush, scrub or tree to be seen, but of course our first movement in the spring will be to plant both fruit and shade trees, of which we had a carload shipped here last fall, for which the North Western Railroad Company did not charge us anything, so you may hear from us in

future from this section of country. Fruit of all kinds with us in Winona county was a good crop last year. We sold some five hundred bushels of apples; some 2,000 quarts of berries from our seedling strawberry, from a small patch. Raspberries we had none.

Should you wish anything from us for the winter meeting, drop me a postal, stating what it might be, and I will give you the information as far as I can. Wishing you and the Horticultural Society success,

Respectfully,

JOHN HART.

LETTER FROM J. M. UNDERWOOD.

LAKE CITY, Minn., Jan. 19, 1879.

Prof. C. Y. Lacy, Minneapolis, Minn.,—

DEAR SIR:—I regret exceedingly that I cannot meet with you as I contemplated doing; but sickness in my family prevents me, and I am compelled to forego the pleasure.

Our section, however, will be ably represented by my friend and partner, Mr. S. M. Emery, and our fellow townsman, Mr. O. Gibbs, whom you will remember as secretary of our L. P. A. U.

Wishing you all a most pleasant and profitable meeting, I am,

Respectfully yours,

J. M. UNDERWOOD.

LETTER FROM HON. WM. G. LE DUC.

DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C., Jan. 8, 1880.

Prof. Chas. Y. Lacy,—

MY DEAR SIR:—I have yours of 3d inst., and in reply, you know, or if you do not, I will tell you, that owing to a chronic disorder of the throat I have been for 25 years precluded from attemping to read or speak in loud tone of voice continuously for any time necessary to deliver addresses, or like exercise of the vocal organs; hence have never practiced public speaking, and having no gift of oratory, never attempt to "address" a meeting in any formal way. Will be pleased to meet your society and have a talk in a familiar, conversational way, if, at the time, I can get away from here—which may or may not be possible.

Yours truly,

WM. G. LEDUC.

LETTTR FROM WM. CANNON.

FORT A. LINCOLN, Dakota Ter., Dec. 29, 1879.

Chas. Y. Lacy, Esq., Minneapolis,—

DEAR SIR:—Have just received your kind and welcome card. Owing to a "spell" of cold weather, have not received any mail for a week; am real

sorry that I cannot add anything to the meeting, as my time is fully employed, and my mind not being as much engaged as formerly in horticulture, have since living in this wild country lost a great deal of interest, as I rarely see a flower of any kind; but as I wish to remain a member (if not an active one) of the society I enclose you one dollar. Hoping you may have a pleasant meeting and an increase of interest and membership, believe me, as ever,

Yours fraternally,

WM. CANNON.

MR. HOLLISTER'S PAPER.

A paper on "The Garden on the Farm" was then read by U. S. Hollister, of St. Paul. The paper was ordered filed for publication and was as follows:

Where shall we draw the line separating horticulture from agriculture, in the common acceptance of terms used to designate these professions? Agricultural conventions meet to discuss cattle, grains, vegetables and general agriculture, including many horticultural questions.

Horticulturists in session discuss fruits, flowers, vegetables, and many questions strictly agricultural.

Agriculture, horticulture—twin children of mother earth, born in the same epoch—they have friendly gone hand in hand since men had first record of one another.

The one has gladdened the world with bread; the other has smiled on us from our gardens, and by ministering to our finer nature, has made the world a better one.

As a student of both, I have never yet learned to love one better than the other. I am content with either, when the other is away; am not confused when both are present, as I find their representatives here to-night.

We cannot draw the line between the choice little dwarf apple tree of the garden and the great commercial orchards of the farm.

We cannot draw the line between the finer vegetables and the potato; we cannot draw the line between Indian corn and sugar cane.

We cannot draw the line between the lawns of our city homes and the blue grass valleys of the farm. Let us give it up, and acknowledge that we are big and little farmers here to learn how much we can improve our condition by accepting the gauntlet that nature has thrown down at our feet, and by intelligent toil improve our products and meet needs, and enhance the pleasures of life.

I take this position that you may the better understand why I thought fit to talk about potatoes and cabbages in a horticultural meeting.

From the observation of travel and a life among the farmers, I am led to know that as a general rule farm gardening is the most neglected, the most slip-shod department in agriculture.

You all know how it looks. In riding through the country the only indication of a garden on many farms is the very strong and thrifty condition of the weeds on a little plot somewhere near the house.

After all the field crops are in and the hurry of spring work is out of the

way, the good housewife persuades her agricultural lord to plow the garden. This is usually done on Saturday, just as he is in a hurry to go to town, and the job is rushed through in orthodox style. He goes to a grocery and buys a five-cent paper of onion and beet, a ten-cent package of peas, and perhaps a dozen other sorts in the same proportion. They are selected from a commission box of slop-bucket seeds, and it is a great relief if they don't grow, as in that case all trouble about the garden is done, until time to go through the same experience the next year. Under the most favorable circumstances a few sickly products are gathered and it is voted that a farm garden don't pay. Now I take the position that as a matter of economy a good farm garden is a paying necessity; considered from a sanitary point, a noble charity.

There is no doubt but half the doctor's bills could be saved by the farming community, and the people kept in better health if a thorough and persistent plan of liberal supply of wholesome vegetable food was the rule instead of the exception.

Let us lay out a plan for a farm garden. We will call it one acre in extent. Ten rods by sixteen is a good form, the largest way east and west, in order that the rows, which to accommodate variety should run the short way, may run north and south; thus giving equal distribution of light and heat from the sun. Shelter from winds is an important item. Plant a double row of Scotch pine around the east, north and west sides, and some low growing evergreens, or one that can be sheared down to six feet on the south, in order that we are not too much troubled with shade. Inside of these rows of trees there should be a border all around the garden of at least eight feet of blue grass or white clover sward to turn the team on in plowing and cultivating. Understand we are writing of a vegetable garden, and as such we do not want a currant-bush or shrub of any kind within its sacred limits. Give these important factors a plat by themselves.

I have no sympathy with the old style of garden, that must have a row of currant or raspberry bushes about every ten feet, with the intermediate space devoted to vegetables. It is inconvenient to cultivate and unsatisfactory in its results.

So plan and arrange that every foot can be plowed, and that all the sorts that are strong growers can be cultivated by horse.

If practicable the exposure should be south or east. The soil must be good, either naturally or from the liberal application of fertilizers. There is no vegetable crop but is better in proportion that the soil it grows in is made rich, until a certain limit is reached.

Even beans, reported to do well on land too poor for any other use agriculturally, will do better in land that will grow one hundred bushels of corn to the acre.

Having your ground well prepared, you will see that you procure seeds from a reliable source, for you are in earnest now, and cannot afford to plant poor seeds.

Supposing that you have selected everything—the best of its kind—we will proceed to plant:

Beginning upon the west side, we will plant two rows of Burr's improved evergreen sweet corn; next two rows of Moore's Concord, then two rows of Crosby's Early, and lastly four rows of Early Minnesota sweet corn.

Here we have ten rows of corn, occupying a space of thirty feet across the garden, and of just the sorts that will keep up a regular succession from the earliest to the latest period of the season for table corn, and all accomplished at one planting.

Next to the corn will be a good place for one row of Hubbard squash, and as they need a good deal of room, can be partially accommodated in the corn. This row of squashes must have a space of at least twelve feet wide. Next to squashes will be a capital place for ten rows of early Ohio, or any favorite early potato. Next to these, four rows of Snow Flake, as the best autumn potato.

There must be a promiscuous row somewhere, and we will place it next to the potatoes. In this plant half a dozen hills of summer crookneck squash, a few hills of okra and martynia, if you like it, and a few plants of pepper and egg plant to finish the row.

We will now leave a space of ten feet upon which to plant ten hills of early frame, or short green cucumbers, both for early use green and for pickles, and a few hills of Boston market white spined for table use later. We want a good supply of cabbages, and will plant two rows of early Jersey Wakefield for first early, one row of Fottler's Brunswick for second early, and two rows of Flat Dutch for late.

Peas are a luxury that you want in abundance. Plant two rows of Philadelphia extra early, two rows of Little Gem, and two rows of Champion of England. These sorts, if all planted at the same time, will give you a good succession from first to last.

For snap beans, one row of Early Valentine and one row of either the German Wax, Black Seed or the Golden Wax. For shell beans one-half of China Red Eye and one-half row of Horticultural pole; also plant one row of large Lima for use, both green and dry shelled. You want one row of Egyptian turnip beet for first early and a row of Dewing's blood turnip beet for fall and winter use and to keep until spring. The beets may be sown thickly and thinned to eight inches as needed for greens. You will want one row of Danver's half long carrot, one of long sugar parsnip and one of Salisfy. Plant half row of Snow Ball cauliflower and half a row of late London.

Of onions you will want enough for summer and winter use. Two rows planted to setts will answer for the former

For winter use sow ten rows of red Wethersfield or yellow Danvers.

You will plant more or less tomatoes, according to fancy. There are so many new ones and so many good ones that it is a matter of taste regarding which is the best.

The Gen. Grant is a fine, large, early tomato. The Trophy is a good late one. The Acme, a meritorious candidate for favor, and our new St. Paul, a child of Minnesota origin, is bound to take a permanent place.

The best new lettuce is the Dutch Butterhead, and the best old sorts the white-seeded Tennis Boll and the Early Curled Simpson.

A couple of rows of Sandringham celery will not be out of place, and you need a little space for long scarlet-scarlet turnip and white turnip radishes, the latter remaining fit for use longer than any of the others, and of most excellent flavor.

The time of planting must, of course vary much with all these varieties.

As the earliness of vegetables has much to do with the satisfaction of growing them, it is of prime importance that you have a hot-bed in which to grow early plants of cabbage, cauliflower, tomato, and egg plant.

Onions, beats, parsnips, lettuce, peas, radish, and spinach cannot be planted too soon after the ground settles in the spring.

Corn, beans, carrots, cucumbers, melons, and squashes after the ground begins to get warm.

Experiment a little with early planted sweet corn. It is usually planted later than need be.

With all this array of culinary vegetables the acre is not yet planted, and you will have plenty of space for Phinney's early and mountain sweet watermelon, green nutmeg, and white Japan muskmelon. These last are the best of their kind for this latitude. You can still find space for any vegetable novelty, or anything on this list not mentioned, that you may happen to fancy.

Everything is in rows and under flat culture—that is, we do not raise hills or ridges for anything.

Corn, cabbages, cauliflower, and peas are in rows three feet apart, and at a distance apart in the rows to accommodate the sorts. Beans two feet by one; tomatoes four feet apart each way; beets in rows eighteen inches apart; carrots, salsify, and onions sixteen inches, and always better a little too thinly than too thickly in the row.

Plant all small seeds with a planet drill, and cultivate with a wheel hoe, when the plants are small, and with a horse whenever and wherever it can be done without injury to the plants.

This seems like a big garden, but if corn, cabbages, potatoes, peas, squashes, cucumbers, and tomatoes are all cultivated with a horse, and you have a wheel-hoe to work closely planted rows, and the weeds are kept out from the beginning, you will be surprised at the little labor required to grow so much valuable product.

The model American farmer will be the one who tries to make his country home a pleasant one, who cultivates his fields well and cares for his flocks and herds, and who cares as well for his family, who, by surrounding his home with gardens of fruits and flowers, compels the gratitude of his dependents and the respect of his neighbors.

In my travels about the country I have been impressed with the cheerless aspect of the country homes, as in comparison with what they might be.

Not a single natural attribute to attract or please.

A scraggy, unshaven face of Nature, perverted rather than beautified by its inhabitants. These men, Christians though they may profess to be, are false to nature's God. No man has a right to distort his surroundings to correspond with his nature.

Study to make your farms the fit abiding place for the fairest and brightest in the land, and then you will find them there.

Then the country and the city—strength and culture—agriculture and horticulture, will go hand in hand. The billowy wheat, the waving corn, the flowers and fruits of our new Northern home, in harmonious blending will show nature's law—that man and nature are made each for one another.

DISCUSSION.

Mr. Day. I feel that the paper is so good that it needs no discussion.

Implements.

Secretary. Think the writer might well tell us something more about the wheel hoe.

Mr. Hollister. I did not come here to advertise any man's implements. I would use a wheel hoe. I think it is practicable to use a horse in the garden. I used Allen's Planet Junior Wheel Hoe.

Beans.

Mr. Fish. On what soil do you plant beans?

Mr. Hollister. We have been growing beans on the same ground that we grow wheat and corn on. We always get the best crop from the best ground. The Early Valentine, Mohawk, and any German wax beans yield abundantly.

Wheel Hoe.

Mr. Harris. I think it pays to own a wheel hoe. Women can use it. With a wheel hoe a woman can go over a piece of ground in one day while it would take her two or three weeks to go over it with the hand hoe. The wheel hoe cuts the weeds closely and loosens the soil. I can run mine within ¾ of an inch of my onion rows. It will do the work of six or eight "raw men." It is an easily worked machine and easily kept in order. I think every farm ought to have a garden. A good, nice garden cultivates the farmers and their children. I never saw a soil too rich for any snap beans,—never too rich for anything in the garden.

Secretary. I agree with Mr. Harris on the value of the wheel-hoe to the farmers. The implement dealers ought to press their garden implements upon the farmers more. If farmers were better acquainted with the wheel hoe, we should have more gardens, the labor being rendered less an objection.

Mr. Gibbs. I would add a fruit garden to the end of my vegetable garden, and let the rows run so as to cultivate both with a horse.

Mr. Probstfield. I would have no horse in my garden. I like to have my garden as "smooth" as possible, and prefer the hoe.

Asparagus.

Mr. Emery. I would like to hear something as to the manner of getting a good asparagus bed on the farm.

Mr. Hollister. This question has been answered a good many times. The trouble with the people is they do not like to take the time and necessary trouble at the beginning. I made my ground rich, plowed it well, and planted the asparagus 12 inches apart in rows.

Mr. Elliot. Asparagus is one of the easiest things to cultivate, and it bears abundantly. Keep the bed clean from weeds the first year and you will have no trouble afterward. Keep the ground well manured. Plow ten or twelve inches deep, and plant roots one or two years old, not older than two years, in hills about three feet apart, with four or five feet between the rows. Don't cut too early. Do not cut the first year and only slightly the second. Salt brine spread over the bed is very good,—nothing better. I usually cut to about the 20th of June.

Mr. Harris. The best asparagus bed I know is that of a German, a neighbor of mine. He has very rich ground. He considers sheep and cattle manure the best. He plows as deep as possible the first time and then plows again, to mellow the ground up well. His rows are about three or four feet apart. The seed is about six inches below the surface, After the plants are pretty well established he thins them down till 16 inches apart. He covers his bed with manure every fall. Commenced cutting the third year.

President Grimes. Is there more than one variety of asparagus?

Mr. Harris. I think there is.

Garden Plow—Transplanter.

Mr. Abernethy explained a plan of his with which he can plow fast and easy. He pulls his implement after and says he does better and faster plowing than his neighbors do with the wheel hoe. He can throw the dirt on any side. [Being requested to bring it to the rooms for inspection, he said he would.]

Mr. Hollister. I think the best thing of the new implements is the transplanter. It is good, simple and practical. Works like a post hole digger.

Mr. Elliot. Think there are two distinct varieties of asparagus.

MR. PEARCE'S PAPER.

The discussion was here closed, and the next subject taken up, which was a paper on "Locations and Exposures for Orchards," by M. Pearce, of Minneapolis.

The paper was accepted and placed on file for publication. It was as follows :

FRUIT TREES—LOCATION AND RESULTS.

Will Minnesota ever be a great fruit-growing State? Yes, without a doubt. When will it be? When fruit growers are educated to think and observe for themselves, and understand what varieties of soil, location, cultivation, and care of fruit trees is absolutely necessary to make apple-raising a perfect success. My experience in Minnesota covers a period of over twenty-five years. I am familiar with the climate of the State,—cold winters, warm winters, early frosts in the fall, late frosts in the spring, and occasionally summer frosts. I think to early frosts in the fall and late in the spring we can attribute the destruction of trees and fruit more than any other season of the year. It is a well known fact to all, that there is a marked difference of temperature at the same time between the low land and valleys and high lands. It is often the case on low lands and valleys, while the trees are still growing and full of sap, a sudden freeze congeals the sap, ruptures or cracks the bark, and thus badly injuring the trees and preparing the way for the flat-headed borer to do its work, which finishes the destruction of thousands of trees annually, while those on high land are not injured, owing to the high temperature, caused probably by a circulation of the air. We notice the same result in the spring; the trees are not only injured, but usually the fruit killed, while on the high lands it is seldom the case.

Again, there is quite a difference of the same varieties of trees grown on the low, rich lands and valleys and those grown on the high lands. The former make a more rapid growth, contain more sap, the joints further apart, poorer bearers and less hardy; while those on high lands are closer jointed, less sap, more hardy, and much better bearers. I am acquainted with two orchards; they have both had the very best of care and cultivation. One is on high land, and the other is in a valley between the hills. The trees of the former are in perfect condition, have borne heavy for years and among the selection is the Geniton and Ben Davis. The one in the valley has never produced a peck of apples, and the most of the trees are in a very unsatisfactory condition, to say nothing about location. The same results are to be found in regard to locations all over the settled parts of the State, with the exception of orchards in close proximity of lakes and large rivers, which have a wonderful influence in keeping the temperature even and the air moist. Such location, with suitable soil, are probably the best for apple raising in the State. Peach trees on such locations in this State produced fruit last season without protection. In my judgment there are many thousand fruit trees in orchards that will never pay expenses, owing to bad location, and if not too large it would be better to remove them to more favorable ground. Orchards are often planted convenient to

buildings regardless of soil or location; often when a first class orchard site could be had on some other part of the farm. In many cases it would be better to erect buildings where you could raise fruit regardless of other minor conveniences. By past failures much useful information has been attained by intelligent fruit growers, and from this on, soil and location for orchards will be more judiciously selected than heretofore; and then, and not till then, will our long cherished hopes be realized—to be able to grow all the apples that is needed for home consumption and a large surplus to ship to our less fortunate neighbor. Light is breaking, the time is not far in the future.

DISCUSSION—*Soils.*

Secretary. How can a large class of soils not especially adapted to, and not especially unsuited to, the cultivation of fruit be best prepared for it?

Mr. Pearce. This is a hard question. It is absolutely necessary that wet, sticky, or sour land be well drained. Wet, sticky soil may do for willows, but not for apples. A great many soils are more or less injured by frost. Many times the trees grow, but they bear no fruit. To some extent, not to a certainty, blight can be prevented by late winter mulching. Mulch with straw. Don't let it thaw; keep the trees where they are. There is such a thing as holding back the fruit by keeping the ground covered too long. Mulch ground that is subject to late frost.

Mr. Harris. Do you believe in chip manure?

Mr. Pearce. No, I do not. But it holds the frost out longest.

Mr. Jordon. I should plant fruit trees in any soil good for wheat or corn. I have a piece of land that was very wet before I drained it. The slope is southwest. On this land I have Wealthies 5 years old, and my Duchess of Oldenburg are doing well. If I can get high land or nothing better than good wheat or corn land, I will raise an orchard.

Mr. Pearce. Would you plant on low land.

Mr. Jordon. No, sir. I think we do not give the Jeniton place enough; they are a better apple than believed by many. The root grafted gave me no apples, but the top grafted did well; in fact they bear too much, and the fruit becomes small.

Preparation of Soil—Experience with Varieties.

Mr. Pearce. How was that wet land of yours prepared?

Mr. Jordon. Soon after I had broken it a heavy flood washed out a deep ditch. Where the ditch was too deep I partly filled it up with straw, manure, &c., and kept it for a drain. My Wealthy

on this land wintered as well as those on the high land. I like top-grafting for the tender varieties best. Some varieties do well on the Transcendent and Hyslop. Last summer the blight got at my top-worked Transcendents. The limbs of the Transcendent had turned black, but not a sprout of the Wealthy on it had been blighted. This goes to show that close proximity has nothing to do with the spread of the disease.

Top Grafting—Soils Again.

Mr. Kelley. Mr. Jordon's experience on the Transcendent is just the opposite of mine. This year the Ben Davis, Wealthy, Duchess, and a few Saxton's top-worked on Transcendents are very promising.

Mr. Jordon. Some do good on one kind and not on another. The Ben Davis, on a Hyslop, failed with me. The Rollins' Pippins is an entire failure on the Transcendent, but does well on the Hyslop. The Ben Davis, grafted on a Transcendent close to where the limbs come out, do well. Grafting a fast-growing one on a slow one is not a success, but a slow on a fast is good.

Mr. Harris. Mr. Jordon is wrong about grafting a fast-growing one on a slow one. The fact is opposed to his statement. We can see it in the case of the tame plum on a wild one. Only a few apples grafted on the crab do well. The Saxton and the Mother do well. The Jeniton does well in some parts of the State. It is strange that some stood the winter of '72 and '73 and others did not. We have a great deal to learn yet. Only little by little will we fathom this science of fruit culture. We must learn to be more accurate in our experiments. Mr. Jordon's low-land was of no good for an orchard, but that flood that dug the ditch prepared it. Some grounds are too rich. Trees do not prosper on too rich ground. When we get the wild nature out of the soil by cultivation we succeed. There is a sourness and a taste of alkali in new soil that must come out. When clover and blue grass come in naturally then fruit-growing will be a success.

Mr. Dart. I don't believe one word in the wild nature of the soil. This theory of the wild nature in the soil is inconsistent with the growing of trees. The first failures in Wisconsin were due to the fact that the trees were not adapted to the soil and climate, and because the persons that planted were yet unskillful. Out of over 100 varieties that the nurserymen tried not more than ten were good. Many trees brought from a distance are planted in a damaged condition, and this is one great cause of failure.

Besides, but one variety in ten is adapted to the place. Hardy varieties succeed the first time, if put in good soil. It is not the high ground on a northeast slope that is the best for an orchard. It is level rolling ground. The easiest way to prepare this rolling ground is to plant the trees on the surface in ridges, making a little hill around the tree. Under such conditions I think the chances are very good.

Mr. Jordon. I have about 6,000 crabs top-worked with apples. And it is a rule in my experience that the fast grafted on the slow growing is successful; failures are exceptional. Every slow kind on the fast is gone or is going. I take pride in my orchard, and think it will stand comparison with any orchard in the State, and all of my trees are planted on new land. I have trees doing well on land never grubbed or plowed; it was too stony for such work.

Mr. Harris. Experience shows that if we break up prairie soil and plant trees in it, the trees do very well at first, but the first hard winter kills them. In new soil I would want rocks. We know certain varieties will never succeed here. We must have a pomology of our own.

Mr. Elliot. One exposure of orchards is left out of consideration—the exposure to thieves.

Mr. Storrs. How would Mr. Dart explain the fact that we can raise certain varieties on our old soil that we couldn't raise when it was new? We can now raise fruit on some cultivated land that we couldn't raise ten years ago. After more clay has been worked up into the soil, the condemned varieties grow.

Mr. Jordon. Why can't you raise the same wheat you could ten years ago? (Some remarks were interchanged on the wheat question, and the Secretary thought Mr. Storrs had answered his own question.)

Mr. Storrs. I wanted to have the question answer Mr. Dart's theory.

Mr. Dart. Men often don't get the true variety, and they are in a new country and do not know its requirements. Possibly some years the gentleman got wrong varieties, but now, after having had experience, he can tell the true from the false.

Mr. Gould. I think the question is getting mixed. Think next spring will decide the question of new and old soil. There has been nothing to hinder our trees since '73. But next spring they will look pretty sick. We have had 40°. The Duchess and Tetofsky will not bear neglect. If planted on new ground and well taken care of, they will succeed in a timber clay soil.

Planting.

Mr. Phillips. Many think they must dig down to hard soil. Now, there the roots have not enough heat to start the sap; they are *too* far down. I know one that set down very deep to protect the roots from frost, and now they are all gone. I set mine as deep as they naturally grow, and they all do well. I have used pumpkins for shading my trees, and they did very well. They do not draw the moisture from the trees. Pumpkin vines did best for me.

Mr. Harris moved to adjourn till 9 o'clock to-morrow morning; which motion was carried.

WEDNESDAY MORNING.

The meeting was called to order by President Grimes at 9:30 o'clock.

The exercises were opened by vocal music rendered by Miss Grimes, and followed by prayer by Rev. E. S. Williams.

M. W. COOK'S PAPER.

The regular order of the programme was then proceeded with, being a paper on Strawberry Culture by Mr. M. W. Cook, of Rochester, which was a follows :

STRAWBERRY CULTURE.

BY M. W. COOK, ROCHESTER, MINN.

Mr. President and Members of the Horticultural Society:

Unfortunately several of the larger fruits do not flourish in this climate; and, though the growing of apples is an assured success with us, our orchards are yet young and scattering, and we must still wait many years before having a full supply of this fruit. It is to be regretted that this deficiency is not bridged over by the general cultivation of the small fruits. Even if we had the larger fruits in profusion, the small fruits would richly merit a place in every garden. How much more, then, ought they to be esteemed in the present condition of things? Contrary to the opinion of some people, not well informed on the subject, there is, perhaps, no State in the Union better adapted to the cultivation of several of the most valuable of the small fruits than Minnesota.

Advantages of Strawberry Culture.

The strawberry in particular yields bountifully with us on any soil that will produce crops of grain, and with scarcely more care than is required for corn or potatoes. It comes into bearing much sooner than the large fruits, may be relied upon more confidently for a yearly crop, and is not so seriously affected by insects and disease.

The neglect and apathy of people in the matter of small fruit growing is astonishing. The farmer, absorbed in schemes for land-getting and wheat raising, though, perhaps, himself able to preserve measurably good health on a diet of pork, beans, and potatoes, because so much in the open air, does not always realize that his closely confined wife and his children need, as lighter food, a bountiful supply of fruit. His most active and intelligent sons, tired of the dull, monotonous routine of farm life, frequently seek for change and excitement in the city. They would do better in most cases to stick to the farm; and the father might often keep them there by taking a little pains to interest them in growing the blushing, sparkling, grateful small fruits for the family and market. In studying the growth and habits of fruit plants, experimenting with various modes of culture, reading horticultural books and papers, and raising new seedlings, they might find a fascinating field of labor; one that would afford the variety and pleasant excitement needed to make the spirits buoyant and the mind sprightly; contribute greatly to the happiness of the home circle; and, withal, yield a net yearly income of probably not less than $200 per acre, if they brought to their work a fair amount of energy, good judgment, and careful observation.

Markets.

At present the large cities are quite well supplied with small fruits, but there is a scarcity and an excellent market in all our smaller towns, and even in the country. If the farmer and his sons and daughters (I include the daughters, for they need exercise in the open air, and this is an inviting field for them,) do not choose to cultivate small fruits for market, they can at least have an abundant supply at their own door, fresh and delicious. They are all hungry and thirsty for them, and when the bearing season comes round, never fail to resolve not to let another year pass without a fruit garden. A little later, however, their good resolutions are too frequently forgotten.

Drawbacks.

Doubtless one of the greatest drawbacks to the culture of the small fruits is the want of knowledge of how to grow them; and it is in the hope that I may be able to say something to help to remove this obstacle, and to stimulate farmers and owners of village lots to effort in this very important but much neglected field of labor, that I have consented to prepare this paper upon the cultivation of the earliest, most beautiful and delicious of all our fruits,—the strawberry.

The directions which I shall give, being intended not so much for the professional fruit grower as for those that have had little or no experience in the business, are as simple, plain, and practical as it is possible for me to

make them. I shall endeavor to avoid all theories and to confine myself to facts, learned through an experience of fifteen years in growing a very large number of varieties, and trying a multitude of experiments, in this State.

I shall treat the subject in topics, beginning with

Soil and Situation.

Anywhere that corn or wheat will thrive the strawberry will produce good crops; though some varieties do best on a heavy soil, and others on a light one, while a few succeed about equally well on both. A deep and well drained soil is to be preferred. If the location is near a swiftly flowing stream or an elevated spring, so that the bed can be irrigated at times, the yield and size of the fruit will be very materially increased. The strawberry is sensitive, however, to stagnant water. The fruiting season may be considerably prolonged by setting early varieties on a gentle southern slope, and late ones on a northern exposure.

Manures

Our Minnesota soils are usually sufficiently good to produce excellent crops of the strawberry without any fertilizer, but considerable depends upon the varieties selected. For example, the Wilson's Albany, Great American, and Prouty Seedling yield about in proportion to the richness of the soil. There need be little fear of making it too rich, provided the manure is thoroughly rotted or applied the year previous to setting. The Crescent Seedling, Downer's Prolific, and Green Prolific, on the other hand, are among the sorts that run too much to vines in a very rich soil, and produce fruit sparingly. Cow manure is the best for the strawberry; that from the horse is too heating to be used as an immediate preparation for planting unless thoroughly rotted. Ashes are excellent. They may be applied and harrowed in, a few days before setting the plants, at the rate of anywhere between 50 and 150 bushels per acre, if leached; or one-sixth that amount if unleached. It is also a good plan to scatter them over the bed after bearing, and cultivate in. Liquid manure will increase the size of the fruit, but must not be used in hot weather.

Preparation of the Ground.

The only indispensable requirement is that it be deeply ploughed and thoroughly harrowed at the time of planting. But, to secure the best results, it should be taken in hand at least one year in advance, a liberal application of manure made, some hoed crop put in, and clean cultivation given. This land should be ploughed as deeply as possible in the fall, and, if left for spring setting, again at that season.

Time to Plant.

The transplanting of the strawberry may be done either in the fall, from the middle of September to the middle of October, or in the spring. Pot-grown plants may be set with advantage in July or August, and will then produce a fine crop the following season; but layers seldom survive the hot,

dry weather so common at that time. It certainly is a mistake to attempt to set them so early in this State. There is little choice between spring and fall setting. Each has its advantages and disadvantages.

Planting and Cultivation.

Let old plants severely alone, using nothing but newly rooted runners. When they are received from a distance, undo the bundles at once, dip the roots in a mixture of soil and water, and trench out in the shade. In warm weather, watering bundles without untying them, also getting mud on the crowns, causes plants to rot. Select a cloudy day if possible. Set by line three feet by one foot, if a horse is to be used in cultivation; otherwise, two feet by one foot. Throw the plants into a pail of water, or set the roots in a little mud and water at the bottom of the pail, and take a plant at a time from it as wanted. Make a good sized hole for each plant with a hoe or garden trowel; spread the roots out in natural position, and pack fine earth firmly about them. Do not cover the crowns with dirt or put them in such a position that the rains will do this, as it is likely to destroy them altogether. If the number of plants set is not too large, it is an excellent plan, in case the weather at the time is clear and dry, to shade by putting a little straw, a pie plant leaf, or something of the sort over each plant. Remove this shade at night and replace in the daytime until the plants cease to wilt. Watering pays in dry weather. Evening is the best time. The coldest water may be used, as the strawberry, unlike most plants, has a great relish for it. Cultivate the same as corn, keeping the ground free from weeds through the entire season. The cultivator or hoe will turn the runners into line with the rows where they may be allowed to take root, forming matted rows a foot or more in width. Some growers remove the runners and cultivate in hills, but as a rule this plan does not succeed in Minnesota. Beginners, at least, should not attempt it. On the approach of winter weather cover the whole bed to the depth of two or three inches with clean straw or marsh hay. In the spring after plants show signs of starting, if they were set the previous fall, remove the covering from the bed, (it may be burned off without the slightest injury to the plants), and cultivate as directed above. If set the spring before, push the covering a little aside, leaving it between the rows. This mulching serves to keep the ground moist, the weeds down, and the fruit clean. If weeds spring up thickly in the rows they should be pulled. After the bearing season entirely remove the mulching, clean out the rows thoroughly, either mowing down the plants or not as will most expedite the work of weeding, and cultivate as before. After getting two or three crops it is generally best to plough up the bed, being careful to have a new one started to take its place. If the ground is very weedy, the simplest and best way is to start a new bed each year, get one full crop, and then turn it under. This method secures the finest fruit, but not quite so early as in old beds. Here, again, much depends upon varieties, and something upon soil. Whatever plan is adopted it is of the first importance that beds should be kept free from weeds the first season. Owing to the tendency of the strawberry to throw out new roots close to the crown, the rows soon become ridged up. A bed may be at least partially restored to a level and greatly benefited by the application

of two or three inches of thoroughly rotted manure between the rows in the fall. I have frequently renovated old beds to my entire satisfaction by back-furrowing between the rows with a small plow immediately after bearing, cutting them down to six or eight inches in width, hand weeding the narrow rows left, and cross dragging with a light harrow to draw dirt on and about the crowns of the plants. Though seemingly almost annihilated, the plants started up with freshness and vigor, and made really fine beds.

Sexual Character,

Some varieties of the strawberry produce flowers possessing both stamens and pistils. These are termed perfect flowering or hermaphrodite sorts. They are self-fertilizing, and bear full crops by themselves. Other varieties, and among them some of the best in cultivation, produce flowers having pistils and no stamens, or only imperfectly developed ones. These are called pistillates, and will not bear unless fertilized by some perfect flowering kind planted near them. It is my opinion that, owing to the heavy showers and changeable weather common in this State during the season of blossoming, pistillates are not so readily fertilized as in most localities. I, therefore, recommend that they be set in alternate rows with hermaphrodites, except in beds for the propagation of plants. As pistillate and hermaphrodite flowers may be distinguished with the greatest ease, every one should learn to know them at sight.

Yield.

This of course varies greatly, but with good varieties and fair culture, should not be less than from 50 to 100 bushels per acre. More than 400 bushels per acre have been produced. On my own grounds, in fields where acres of beds all received the same treatment, I have had from some beds a yield at the rate of 200 bushels to the acre in a single picking.

Varieties.

There are not more marked differences in varieties of the potato, as regards size, quality, time of ripening and productiveness, than of the strawberry. Lack of knowledge on this point is one of the chief causes of failure and disappointment. The great majority of varieties are unworthy of cultivation in any locality; some others do wonders in a particular kind of soil, or with a special mode of treatment, but under other conditions are of no value; while a few seem adapted to every description of soil and culture. The introduction, now and then, of a really valuable seedling has so stimulated the production of new varieties that many inferior ones have been sent out with extravagant puffs. My advice to the beginner, whether designing to grow this fruit for market or for family use simply, is to put out, for the main bed, varieties that have been tested in this State, and found to be good wherever tried; and then, if so inclined, to get a very few plants of one or more of the newer kinds that he knows to have quite a reputation elsewhere. The trial may prove them to be admirably adapted to his soil and location, though I freely confess that the chances are against this. The experiment, however, need cost but little, and is oftentimes worth making. Even

for family use I advocate the planting of at least three varieties, an early, a medium, and a late one. As a nurseryman making a speciality of small fruit I have considered it necessary to test all varieties that promised anything, though the expense has been considerable, some plants costing as high as one or even two dollars each. Of about one hundred sorts fruited on my grounds I have recommended less than one-fourth, and never any unless fruited at least twice. The following is a partial description of a few of the best as I find them in this State:

Wilson's Albany. The great market variety. As a shipping berry it is doubtful whether anything surpasses it, though there are many larger and sweeter berries and more robust plants. Very few indeed of the plants scattered about the country as Wilson's are true to name.

Col. Cheney is one of the best with me. It is a pistillate and must be thoroughly fertilized. The best results will not be secured if allowed to become very thickly matted.

The *Green Prolific* is another exceedingly hardy and productive pistillate. It is also one of the latest. The soil should not be very rich.

From the *Seth Boyden* I have never yet failed to gather a fine crop of large, sweet berries. Beds last many years without renewal.

Downer's Prolific is one of the earliest and best. Succeeds well everywhere, and does not need manure.

Kentucky is the latest of the older sorts. Does best on light soil.

Charles Downing is a favorite nearly everywhere.

The above varieties I regard as reliable in this State. The following are a few of the best known sorts that I have tested and believe to be unworthy of culture here. Some of them are valuable in other sections. Triomphe de Grand, Jucunda, Fillmore, Golden Queen, Welcome, Metcalf, Kramer, Agriculturist, Washington, Brooklyn Scarlet, Austin Shaker, Crimson Cone, and Russel's Prolific.

Of the new varieties that I have fruited from one to three seasons, the Capt. Jack, a handsome and remarkably vigorous and productive late variety; and the Crescent Seedling, an early sort, and the most vigorous grower on my grounds, have pleased me much. The latter is a partial pistillate. The Prouty is a marvel of productiveness in rich soil, with an abundance of moisture. The Great American is another sort that is worthless without high culture. The Sharpless is at present taking the lead, at the East, of all the new varieties, and I can testify to its great size and beauty, and excellent quality, but cannot yet judge of its productiveness. Of the Forest Rose, Essex Beauty, Pioneer, Cumberland Triumph, Kerr's State Prolific, Glendale, Endicott, Hart's Seedling, Cinderella, and others I will not venture to express a positive opinion without further trial. Several of them certainly seem very promising, but time alone will enable us to tell whether they are superior to the best of the older varieties.

DISCUSSION.—*Insects.*

On motion, the paper was ordered to be placed on file for publication and the subject was then declared open for discussion.

Mr. Cook. (In answer to question.) Have not been much troubled with any insects. The leaf-roller commenced in one

corner, but I burned this over and I have seen nothing of it since. I put on just enough straw to burn and not enough to hurt the vines, and set fire to it.

Mr. Harris. I have sometimes been troubled with the white grub. The only way I have found is to pick out the grubs when plowing and to kill the beetles before they lay their eggs. The chinch bug, or one much like it, has attacked the fruit stems just before the fruit sets and the fruit appears to blight.

Mr. Cook. By liberal application of ashes, salt and good cultivation, I get rid of the white grub.

Varieties.

Mr. Harris. It is unsafe to endorse the Col. Cheney and Green Prolific. I know of one gardener who put out entirely of Col. Cheney and he gets but a few berries. Another set Green Prolific, and being two miles from market, when he gets them there his berries are mush. The Wilson is pretty safe and the Chas. Downing is nearly safe to recommend.

Mr. Fuller. I endorse Mr. Harris' statements. Green Prolific is an entire failure with me. I sell no vines but Wilson and Chas. Downing. They are reliable, good, and answer every purpose. Have never succeeded in fall planting but once. I cannot do anything with them if the vines are set after September 1st. Can set in August but must then mulch for the winter. Prefer to plant in the spring.

Mr. Cook. The failure of the Col. Cheney is due to a perversion of it. It is pistillate and needs staminate sorts near by. If planted near perfect flowering varieties it will please all and produce enormous crops of good fruit. It is of excellent quality. Green Prolific, valuable for home and near market. It is a vigorous grower. In Rochester it retains a place in market. But it must be fertilized. If put out alone you will simply have vines. I do not say it is one of the best, but that it is valuable. The Col. Cheney must also be fertilized. I know of none for market purposes equal to the Wilson, but you all know its quality.

Mr. Morse. I had three-quarters of an acre of Col. Cheney and Green Prolific, which yielded at the rate of ——— per acre. I sent the fruit to Faribault and they wanted all they could get of the same kinds. The Col. Cheney held out well to the end in both yield and size, and after moving off the leaves some large clusters of berries were found. The Green Prolific fell off in yield early in the season. Is there any plan for keeping the berries over night when there is a full market?

Mr. Cook. When there is a surplus we can them, and put on the market only fresh nice berries. It is almost impossible to keep over night and sell for common use.

Mr. Norquist. The Green Prolific does well with me and I like it. I get more for it than for the Wilson. Of Col. Cheney, I have a few, but they are not well fertilized—only every seventh row being a perfect flowering variety. Think if every third row were perfect flowering it would do well.

Mr. Harris. Am surprised that the Green Prolific sells. I know of $500 worth going into the river the past season. Of Wilson my girl picked 100 to 133 quarts per day, besides assisting in house work, and that can't be done with Green Prolific three days in succession.

Mr. Cook. Green Prolific I get picked for one-half what I can the Wilson after the first picking. Green Prolific does not run down in quantity and size. It is late in both respects.

Mr. Fuller moved that the discussion on strawberries be closed, which motion was carried.

MR. HARRIS' PAPER.

Mr. J. S. Harris was then called upon and read a paper on Methods of Improving Fruits and Originating New Varieties, adapted to the Northwest as follows:

METHODS OF ORIGINATING NEW VARIETIES OF FRUITS.

There is no denying the fact that there are but very few varieties of the apple (*Pyrus Malus*) that are a perfect success in this State. Some of our enterprising nurserymen and orchardists have spent the best of their lives in giving hundreds of the old and favorite varieties of other States repeated trials. A few of them are a partial success, while most of them have been a miserable failiure, and we have become convinced that we must make a "Pomology" of our own, and the material we have to make it out of is the Duchess of Oldenburgh and the Wealthy, perhaps a few new seedlings, and the Siberian species, all producing early and perishable fruits of an inferior quality, or other varieties of uncertain hardiness. For summer and autumn we can get along with the Duchess and Wealthy and a few of the best Siberians; but the great want is a few good varieties with keeping qualities and size and appearances that will make them adapted for all purposes, to supplement the season from the 15th of December to the 1st of June.

Minnetonka Fruit Farm.

The first step has been taken towards meeting this want by the establishment of a State experimental fruit farm at Lake Minnetonka for the express purpose of originating and testing new varietiss. The principal manage-

ment is to be something as follows: The ground is to be quite closely planted with seedlings of the Siberian and Wealthy apple for hardiness, alternated with the best and hardiest apples for long keeping qualities. The theory is that when these trees produce fruit the seeds will have become fertilized from the pollen of the apple, and that their progeny will be hybrids. Of course this is only theory. (I mean the hybrid part.) The most promising of this progeny is to be retained and cultivated until it produces fruit, and the seeds again planted, and so on, continued as long as land can be found to plant them on, or until the desired varieties are produced.

Ground for Hope.

The object is good and the method so feasible that there is a reasonable prospect that our Pomology will be greatly improved, even if no hybrids are produced. In most species of cultivated plants there exists a tendency to variation or the formation of varieties, and this tendency is very marked in the Pyrus and Prune families.

History and tradition tell us that the original parent of the Golden Drop Gages and other domestic plums is the worthless Sloe or Beach plum; that a steady cultivation of the sour crab of Europe for centuries has given us the Baldwins, Pippins and a thousand other delicious varieties of the apple; and that all our melting and sugary pears are the offspring of a wild variety so acrid that no use could be made of it, and that birds and animals would not molest it. And within the memory of some of us who are here assembled, the little Siberian crab has given us scores of seedling varieties much ameliorated in flavor. Some of them increased in size until they rival the popular Fameuse or Snow apple, and their season has been extended from September to December, and it does not require much of a fanatic to prophesy that this species will eventually give us all that can be desired in the line of apples. The time may appear to us slow in coming if we have to depend entirely upon the experiments conducted by one individual, and that in the most primitive manner, for every flower of the apple is a perfect one, that is, the organs of male and female exist in each, and the marked difference in the time of coming into blossom between early and late varieties, and between the apple and crab, make it almost certain that they will fertilize themselves, and that there will be no cross between them; but, as before stated, the Siberians are showing a wonderful propensity for making new varieties, and the season of blooming in the newer varieties is coming nearer to that of the *Pyrus Malus*, thus making it only a question of time when the bees and the bugs will so mix the two species that the coming horticulturist must needs be an expert to locate them. But while this is being brought about, every fruit grower should remember that the desired varieties are yet to be originated, tested and propagated in quantities sufficient to meet our wants, and perhaps will be sold at prices that will place them beyond the reach of the masses, and from eight to twelve years must transpire before we can hope for anything from that source. My friends, can we afford to wait? I think not. I think it behooves every horticulturist in Minnesota and the great Northwest to enter immediately upon the field which is open before us and engage in the laudable work of improving our native fruits and originating new varieties of the domesticated adapted to growing in the Northwest.

Two Methods.

There are two methods by which modern gardeners may accomplish this: the first, by taking a type of a variety or specie and improving and propagating by cultivation and direct or selected seedlings; the other, by cross-breeding between two varieties of a specie the offspring of which is a cross breed, or between two near allied species of a "genus" the offspring of which is called a "*hybrid.*" I believe these methods were unknown until modern times, and hence the gardens of the "ancients" contained but few varieties of fruits compared with ours. The day when it was discovered that plants have sexes was one which conferred a most important controlling power upon the skillful horticulturist,—the power to create varieties almost at pleasure by the intermixture of the pollen and stigma from two different plants, and leaves no longer a necessity of awaiting for nature or accident to accomplish the work. And the past quarter of a century has witnessed improvements in fruits and flowers that surpass those of any previous age of the world. This knowledge and power is free to all, and every man who has control of a rod of ground, may, by an intelligent and systematic use of this power and the means at hand, become a benefactor to mankind by ameliorating some fruit or originating a variety that shall be adapted to this climate.

Cultivation and Selection.

In practicing the first method there are some things which should be kept in mind by those who would succeed. To start with, we require a hardy, vigorous, productive tree or plant from which we are to procure our first seeds. This should be given every advantage of soil, cultivation and aspect to secure the most perfect development of wood and fruit. The fairest and most perfectly ripened should be selected for seeds, and from these all inferior and unripe seeds should be rejected, and only the largest, plumpest, and most thoroughly ripe be retained for planting. These should be planted in good soil, and the plants from them never allowed to become stunted or dwarfed for the want of care; and when they fruit the same care should be taken in the saving of seed as before, giving every favorable variation from the original the preference, and this process is to be continued until the desired end is secured, when it may be multiplied and perpetuated by grafting, budding, or offsets, as the case may be. This method is similar to that which has long been in practice by our best farmers for the improvement of their stock, grains, and grasses. They select the best males and females of their flocks, and rear them in the highest state of perfection by liberal feeding and judicious care, in order to perpetuate and improve the breeds, and save their best corn and wheat for seed; and any farmer would be considered demented or insane who should save the runts of his flock (and rear them at the straw stack) for breeding purposes, and use the nubbins of his corn and screenings of his wheat for the planting and sowing of his fields, and yet this is about upon the principle of expecting to improve our fruits without system and painstaking.

Results of Cultivation and Selection.

This method will apply more especially to the improvement of our native wild fruits by inducing them to variations that may be developed into varieties. This process has given us the Concord grape in only two removes from a variety of the wild "Vitus labrurea." Mr. E. W. Bull, of Concord, Mass., the originator, says he was led to make experiment from the difficulty he had in ripening at his place the varieties then in cultivation. He found a productive wild vine growing near his place that ripened its fruit early and was a very good eating grape for a wild one. He selected and planted some of the seeds and gave the plants good cultivation and care until they bore fruit, then selected seed from the most promising and planted again, and from this second batch came the Concord, which on account of its earliness, production, large size and fine appearance, has become the grape for the million, and is probably more extensively grown in the Northern States than any other one variety; and it is said that the Concord has since become the parent of a number of varieties of every shade of color from pale green to jet black, and that some of them are nearly equal to the best foreign grapes, "Vitus vinifern." And Mr. Bull is confident that our native grapes will yet be improved by this method to equal the best European for all purposes. Doubtless the same course pursued with our best Minnesota wildlings would lead to equally good results. Some of the best of them are certainly worthy of trial.

Professor Van Mons, of Belgium, has applied this practice to the cultivation of the pear very extensively and with good success. He began by sowing the seeds of a healthy seedling that approached as near the original as anything he could find without taking a wild one. In the fifth generation he obtained some excellent fruit and continued the experiments to the seventh generation. He says that he did not preserve every one of the multitude of plants which he raised from seed until they matured fruits, but only those that he deemed to possess points of character essential to the production of good fruit, and the others were destroyed; and so accurate had his observation become by long experience, that he could tell by form of the leaf, color of the branches, and shape of growth, whether the fruit would be good or not. He also observed that each succeeding generation diminished the time for coming into bearing. He raised more than 80,000 seedlings and some two thousand of them had meritorious qualities. By this method the tomato has been advanced from about the size of a potato ball to its present state of perfection, and the strawberry quadrupled in size. Considerable time may be gained in the experiments on tree fruits by grafting from the most promising seedlings upon bearing trees to bring them sooner into fruiting, and I sometimes think that it serves to hasten variations and fix the types. I believe that our native plums might be so improved in this manner as soon to excel all fruits of the prune family.

Cross-Breeding and Hybridizing.—Natural Process.

I have not much knowledge of botany and would much rather end this paper right here, fearing that I shall not be able to make the subject sufficiently plain to be understood. Fortunately most of the fruit trees with which we have to do bear perfect flowers, that is, those which are capable of

fertilizing themselves. According to Gray & Lindley a perfect flower consists essentially of two sets of organs, the one called the pistils and the other the stamens. "The pistils are situated in the center of the flower and the stamens around them. The summit of the pistil is called the stigma, and on the top of each stamen is situated an anther, a small sack which contains the pollen or fine dust-like substance that fertilizes the ovules or young seeds of the plant." These organs are supposed to perform offices similar to those of the animal kingdom: the stamens representing the male, and the pistils the female. When the anthers which contain the pollen arrive at a certain stage of maturity they open and emit a multitude of the minute grains of pollen, and these falling on the stigma throw out small hair-like tubes which penetrate through the tissue of the pistils and ultimately reach the ovules, thus fertilizing them; thus making them, when mature, capable of producing plants of their own kind. "The ovules are the rudimentary seeds situated in a case at the base of the pistils, each containing a central portion called the nucleus which is surrounded by two coats, the inner called secundine and the outer peremine. The outer one, when mature, being a more or less hard shell-like substance serving to protect the germ within." When the pollen grain passes through the orifice in these coatings of the ovule and reaches the nucleus, it is supposed to emit a plantlet germ contained within it, and impregnation takes place. After long fertilizing, the ovules grow vigorously, and at length become fully developed into perfect seeds. The process or manipulations of hybridizing and cross-breeding plants is the same, and consists in the applying of the pollen from the anthers of a stamenate to the stigma and pistils of another flower, at such a time and in such a manner as to effect fertilization.

Artificial Process.

The operation is very simple. The stamens of the flowers to be fertilized are entirely removed or cut away below the anthers when the tree is commencing to bloom, or before the pollen is ripe enough to fall off, and should be immediately covered with a glass jar or small tissue paper sack. As soon as the flower arrives to perfection, or is in its greatest vigor and beauty, the stigma is covered with a coating or mucus, and now is the time for the operation, which is done by taking the staminate flower from its parent stalk when it is just ripe enough to scatter the pollen easily, and holding it over and near the female flower and striking it with a finger of the other hand, when the pollen will fall upon the stigma and pass down through the pistil into the ovule, or it may be applied with a fine camel hair brush,—first touching it to the pollen, and then passing it carefully over the stigma It is well to repeat the operation a few hours later, to insure perfect fertilization. The covering should only be removed while the operation is being performed, and immediately returned to remain a day or two, to prevent accident or insects from defeating the experiment.

A difficulty sometimes presents itself in that the different plants do not bloom at the same time. If it is the flower to be used as the male that matures first, the stamens may be taken off and wrapped in a thin piece of sheet-lead, and kept in a dry place for several days; but if the female matures first, the blossoms must be retarded in some manner, or pollen be procured from some warmer climate. It is generally conceded by those who

have practiced these methods of improving fruits that the male exercises the stronger influence in the formation of the future plant. Mr. Peffer, of Pewaukee, says we should look to the female for hardiness, size of fruit, and shape of tree, and the male for earliness or lateness, flavor, color, and productiveness. At the present time there is considerable interest felt in the subject, and most wonderful results have followed the labors of Allen, Arnold, Rogers, and Rickets, in hybridizing some varieties of our native grapes with the foreign. The tree fruits are not so difficult to operate upon, and it is well worth our while to encourage experiments with our native and the domestic plum, and the apple and Siberian crab or some of its descendants. Necessity is often a blessing in that it leads to invention. May our necessity lead us to fortune by hastening the time when Minnesota fruits shall be her glory.

J. S. HARRIS.

As closely connected with the foregoing subject, Mr. Harris read also the following, on

HYBRID APPLES.

Many of our Western nurserymen are describing and offering for sale a number of small varieties of apples under the name of hybrids, some of them seedlings of Siberians and others of unknown origin. In my opinion this practice is unwarranted, and will tend only to evil and should not be sanctioned by this society. It tends to deceive the farmers who suppose the term implies something better than either Siberians or apples; and if some of them should after sufficient trial prove to be worthy of being retained in our fruit lists, there will arise confusion in cataloguing and getting them in the lists where they belong. Every person who originates a new variety of fruit of value should be required to make a written statement describing the fruit and its origin, probable hardiness, age, when it commenced bearing, soil upon which it has been grown, &c., which statement should be filed with the secretary of this society before it can be placed upon any of our lists and recommended for trial. If they are true descendants of the Siberians they should be named as such, while if they are seedlings of the common apple, degenerated in quality and dwarfed in size, but have the merit of extreme hardiness, let them go upon trial as such; then, when some enterprising horticulturist succeeds is producing a set of true hybrids, they can be presented to the public in their proper place and stand or fall on their own merits. It cannot be proved that a single one of these Siberian seedlings are hybrids, and it is fortunate that it is so, for if a hybrid between the Siberian and the apple is no better than these there would be but little encouragement for attempting to improve our apples in this manner. But there is strong circumstantial evidence that they are not hybrids and that some of them are very poor descendants of the apple. There is a tradition in the southern part of the State that many years ago an emigrant crossed the river at La Crosse late in November, and had with him a bushel of Siberian crabs, and that when he arrived at Hesper, Iowa, he found them frozen solid, and considering them worthless threw them out, and that some one picked them up and planted them, and the result was a number of varieties of hybrids, the Gen. Grant being one of them. They could not

have been Siberians, for at that time there were no varieties of them in cultivation that would keep so late in the season. I mention this only as hearsay, not as a fact; but now I will give you some facts. The Siberian species blossoms become fertilized and set their fruit several days before any pollen from the apple is sufficiently advanced to be available for making a cross with them; and before the blossom of the apple is sufficiently advanced to receive fertilization, the pollen of the Siberian has been scattered to the four winds, and, therefore, there can be no possibility of their progeny being accidental hybrids. In my diary for 1878, I find the following record of observations: April 17th. The blossoms are commencing to open on the Transcendent and other Siberian crabs. April 20th. The plum and cherry trees are in full bloom, and color is beginning to show on the buds of the red and white Astrachan and Duchess. April 23d. The crabs now look magnificent, being in full bloom, and the buds on the Astrachans and Duchess are about ready to open. April 28th. The high wind has stripped all the bloom from the plums and crabs and they have set very full of fruit. April 29th. The Duchess and Astrachans are in full bloom, and the Baily Sweet, St. Lawrence and Fameuse, are beginning to open out, and Tallman Sweet, Walbridge and some other varieties are beginning to show color. May 6th Tallman Sweet, Northern Spy, Walbridge, and all late keeping varieties of apples are in full bloom, and the fruit on the Transcendent is about as large as peas. No doubt intervening cool days made a greater difference between the times of blowing than there is some other seasons, but in order to become crossed or hybridized without aid from the gardener, the time must be very near the same. I find that some of our Western nurserymen have tested the seeds of some of these new varieties and find them to germinate and produce as thrifty trees as the Pyrus Malus. This, according to some eminent botanists is evidence against their being true hybrids. F. A. Knight, late president of the London Horticultural Society, whom Professor J. Lindley in his work upon gardening declares to be the best horticultural physiologist the world has known, says: "I have never yet seen a hybrid plant or annual capable of affording offspring which has been proved by anything like satisfactory evidence to have sprung from two distinct species." [Hort. papers, English edition, p. 253.] And on the same page he says: "I must, therefore, continue to believe that no specie capable of producing offspring, either of plant or animal now exists, which did not become such immediately from the hand of the creator." Professor L. Agassiz has expressed about the same ideas in even more forcible language. History and science both demonstrate that sterility is a natural consequence in the hybrid, and sterility is not a characteristic as far as my observation goes in any of the new Siberians. Therefore, the natural conclusion is that they are not hybrids, and some of the best of them may yet perform an important office in the production of new and valuable varieties of hardy, long-keeping apples.

JOHN S. HARRIS.

DISCUSSION.

Motion was made and carried to file for publication, and the subject declared open for discussion.

Mr. Jordon. Like produces like; hence little cherry crab can't produce the large apple without crossing. In our native crab there is only one character of fruit. It is always sour, and its season winter. This is explained by the fact that it blossoms two or three weeks later than the apple and Siberian crab, and hence does not cross with them. The Wealthy shows its crab parentage by its seeds going back and producing Siberians. Mr. Gideon says it grew from crab seeds brought from Bangor. The majority of seedlings of the Wealthy are Siberians. There can be no mistake about this, as Mr. Gideon is very careful about saving and labelling the seeds. The Wealthy top works on all kinds of Siberians readily. It seems to assimilate well with them, but it is not successfully top-worked on the apple. It is a failure even on the Duchess. These facts further indicate its origin. How are the Transcendent and others of its class produced if there is no crossing of apple and crab? If the Siberian crab had been kept by itself it would have retained its character, but planted in an orchard of apples where its flowers are fertilized by them, occasionally something different comes from its seeds. We have several varieties that certainly come from one variety of Siberian crab. The Orange, Minnesota and others come from seeds grown on a Siberian crab tree standing in an apple orchard in South Bend, Ind.

Mr. Harris. "Like produces like" does not prove the hybrid origin of the improved seedling Siberians. They are the direct result of repeated sowing of seeds, improved cultivation and soil, and of nothing else, and I can see no reason why they shall not continue to vary until time of blossoming becomes the same as that of the apple, and then crosses between them will be possible. We are not justified in calling these improved Siberians "hybrids" and sending them out as such.

Dr. Twitchell. How is this great change from Siberian crab to Transcendent, &c., produced in one generation?

PROF. BUDD'S LETTER.

The letter of Prof. J. L. Budd on the Production of Seedling Apples and the introduction of Russian Varieties was read by the secretary, as follows:

AGRICULTURAL COLLEGE,
AMES, IOWA, Dec. 27, 1879.

Prof. C. Y. Lacy—

MY DEAR SIR: Your favor is at hand. I have long wished to visit your State and to compare notes with your fruit growers, but it seems unfor-

tunate that the meetings of our State societies occur on the same days. For twenty years I have watched carefully your attempts at progress in adapting varieties to climatic extremes, and I have sent many thousands of Duchess, Tetofsky, Gros Pomier, Peach, Vermont Crabs, etc., to your State, at an early day in the history of your organization.

You ask me to give a few notes on the relative claims to public attention of the Russian fruits and of seedling varieties. Not in the form of an essay, but as a free and easy talk, hastily written, I wish to urge upon your attention two or three leading thoughts, which do not seem to have had due weight in your deliberations as a society.

Seedling Production of Iron Clads.

The first is regarding the methodic production of desirable "Iron Clad" varieties of the apple and other fruits by seedling production. The idea is by no means new, as during the years following the death of Van Mons, Knight, and London, the pages of the Gardeners' Chronicle—under the able management of Dr. Lindley—were richly sandwiched with items of experience in this line which we should consider valuable. The origin of the Wealthy gives the key note to this thought. Its maternal parent was, beyond a shadow of doubt, one of the thick-leaved crabs of the Astrachanica type common in Canada and Vermont. Its inherent ability to brave summer and winter conditions of prairie climate is derived—by a law of descent admitted in Europe for over one hundred years—from the crab. It is equally certain that its sudden acquisition of desirable size and flavor of fruit is from the pollen of improved southern varieties. In Europe and America we have very many authentic cases of this sudden development of primitive forms by a single cross. In our brief horticultural history we are not destitute of striking examples.

Mr. Rogers, of Salem, Mass., transformed the worthless, wild sage grape, into varieties of rare excellence and beauty as the result of a single cross. Yet the vines of the mystic product so far retain the hardiness of the mother stock, that they prove hardy wherever the sage grape can maintain health and fruitfulness.

Mr. Hovey gave us the first of our family of great-sized and luscious strawberries by a cross of our native species with the Frandiflora of South America. In this cross we secure the larger and sweeter fruit of the southern species; yet we retain to a wonderful degree the cariaceous leaves, the low crowns, and the far-reaching, wiry roots of our native form. Still again, a recent example is given in the seedlings of the coarse-fruited and thorn-like leaved Sand Pear. A single cross gives the large and good fruit of the southern forms of the pear, yet its seedlings retain the peculiar leaves and habit of the primitive form.

In all these cases the new varieties are all right as desirable acquisitions so long as they are propagated in the usual way. But when we grow seedlings of any of these fruits, suddenly developed from hardy native forms, we cannot expect that they will prove as hardy as the maternal parents. The less hardy element represented in the fruit, in all cases, will crop out in the second and all succeeding generations. I do not expect to hear of a seedling from the Wealthy, the Delaware, or Salem grape, the Charles

Downing strawberry, nor the Cincinus or Le Conte pear, that will inherit the inherent hardiness of its maternal parents. The seedlings of the Duchess perfectly illustrate the idea. It has precisely the history of the Wealthy. Its mother was the Astrachanica crab, and its character of fruit was derived from the more southern forms of the apple found on the north shores of the Caspian, near the mouth of the Volga. So far as I know, not a single variety desirable on account of size and flavor of fruit has yet been grown from the seeds of the Duchess that is strictly iron-clad. Clark's Orange, and Pewaukee, are fair samples of its best products, and they grade as to hardiness about with Ben Davis Possibly Clark's Orange may grade as high as Fameuse.

In my humble opinion the people of Minnesota may expect greater results from one hundred seeds of Virginia crab, fertilized with varieties like Winter Fameuse, Canada Baldwin, Magog Redstreak, or other winter varieties which may be grown top-worked on the same stock, than from ten thousand seeds of Wealthy, Duchess, or any other decent Russian apple as to quality. I suggest the use of Virginia crab as a mother stock, as I do not see in your list any variety which is so perfect a representative of the thick and villose-leafed Astrachanica crab. We as yet have not got a single variety giving perfect satisfaction, in Northern Iowa or Minnesota, that does not show, in leaf, bud, and habits of growth, its origin from this stock. Some of the varieties which I have imported from Moscow show that they sprang from the Prunifolia, or glabrous-leafed crab. I do not expect any of these to prove valuable. I truly believe that it has been unfortunate for the northern fruit interests that the plum-leafed Siberian crabs were introduced at the West. At the East they took their proper place as ornamental trees, with occasional culinary use of fruit. Here they have worked mischief in two ways. (1) Their seeds, crossed by the common apple, have given varieties defective in leaf and notorious for blighting. In Iowa the latter difficulty is yet more severe than in Minnesota. (2) Their abundant pollen fertilizes every variety in their vicinity to greater or less extent, and the seeds of varieties thus fertilized give mongrel crab fruits, neither desirable as to quality of fruit or character of tree.

Russian Varieties.

Another thought worthy of the careful consideration of your society is in connection with the variation in climate and soil of the great Empire of Russia. I notice that in your discussions you assume that the varieties of the apple imported from the nurseries of Dr. Regel, of St. Petersburg, by the Department of Agriculture, in 1870, are the standard from which you judge of the fruits of all parts of that immense country.

The plain truth is that a vast number of the fruits then imported will prove valueless with you as well as with us. It included very many varieties from North Germany, and Southern Sweden, a few from the interior of Russia, and the balance were such as would mature their fruit in that section noted for cool, short summers. The varieties grown in the vicinity of Moscow, where the summers are as long and as hot as in Minnesota, may be expected to make a better record in character and season of fruit, and ability to endure our summer temperature. In the central district of Iowa we expect to find that the fruits grown in sections still farther south

around Kalouga and Simbrisk, will best meet our wants. On the same principle the varieties of the pear I have imported from the hot, dry climate of the interior, have stood the heat and drought of the past summer much better than those from St. Petersburg.

Yours, Fraternally,

J. L. BUDD.

DISCUSSION CONTINUED.

The letter was ordered to be placed on file for publication, and the discussion continued.

Mr. Day. Last summer some Transcendents into which Duchess had been top-grafted came out a week later than the other Transcendents. May not crossing of the apple and Siberian crab have occurred through some such circumstance?

Mr. Fuller. The crossing of varieties does not entail loss of fertility in the offspring.

Mr. Pearce. I don't think there is any improbability in apple and crab crossing. We can, by mulching, hold back the blossoming of the crab to that of the apple. Have done this, but did not carry out the remainder of the plan, which was to grow seedlings from such cross and to bud their buds into bearing trees to determine sooner the character of the fruit, judging first as to probable value of the seedling from its bark, bud and leaf.

Mr. Emery explained their use of the term "hybrid."

Mr. Woolsey. I have seedlings from a little crab grown on a tree on which Duchess had been grafted. They produce larger fruit than the little crab, but none larger than the Hyslop.

Motion was made and carried to close the discussion, and the society adjourned to meet at 1:30 P. M.

WEDNESDAY AFTERNOON.

The meeting was called to order by Pres. Grimes at 2 o'clock.

RUSSIAN APPLES.

MR. DART'S REPORT.

Reports on Russian varieties of apples, being the first order of business, was proceeded with.

Mr. Dart read his report, as follows:

To the President and Members of the Minnesota State Horticultural Society—

GENTLEMEN: As a member of your committee, appointed to report on Russian varieties of apples, I submit the following:

The past season with us has been very favorable to the growth of trees. Even our most tender varieties have done remarkably well, and but for the severe freeze in early May, forming ice ⅜ of an inch in thickness, it would have been a season of great fruitfulness.

This mildness of the last two or three winters has prevented us from testing more fully the hardiness of the new Russian varieties we have in cultivation in our section, and the late freezing in spring has prevented fruitfulness, so that no report at the present time can be of great value.

I notice a remarkable difference in the growth of trees produced from Tetofsky seed. One makes as good a nursery tree as I ever saw, standing 7 feet high at 3 years old, and seems free from blight and as hardy as any crab, whilst another, with the same treatment, will not average 2 feet at same age.

It is evident that the production of new varieties from seeds of the most hardy apples we now have will, at no distant day, enable us to present a list that will not only withstand all the rigors of our climate, but afford us a bountiful supply of luscious apples all the year round, thus stopping importation and preventing the present rapid flow of our material wealth to more favored localities

Although a severe winter like the present is a "bitter pill," yet let us remember that just as a fire helps an enterprising town by sweeping away worthless rookeries and causing the erection of magnificent fire-proof structures, so these hard winters will enable us to build up a pomology for our State that shall stand the test of ages. Then hail! ye blizzards, and welcome! to 40° below. *You shall speed us on to a lasting victory.*

Respectfully submitted,

E. H. S. DART.

MR. UNDERWOOD'S REPORT.

The report of Mr. J. M. Underwood was read by the secretary, as follows:

LAKE CITY, Jan. 19th, 1879.

Prof. C. Y. Lacy, Secretary Minnesota State Horticultural Society—

DEAR SIR: As one of the committee on "Russian apples" to report at our annual meeting, I will say that while the past summer I had the pleasure of fruiting six varieties of "Russians," I regret that my observations could not in some way have embraced a much larger list. Previous to the severe winter of '72 and '3 we top-worked Russian varieties quite extensively on our crabs; but that winter proved too much for them; most of them were killed outright. A few trees survived, and the favorable seasons that followed have brought some into bearing. Nos. 68, 468, 15, 122, 176 are the ones we fruited. Nos. 15 and 122 are good; but as all were early or summer fruit we thought No. 68 the only one we cared much for. It is

the earliest, ripening with the Tetofsky, rather flat in shape, yellowish ground-work, with reddish tinge, splashed with carmine and blotched all over, occasionally streaked with red; flavor a mild, pleasant sub-acid. We have had equally poor success with our root-grafts of the "Russians;" only those set since the "severe winter" have done well. The claim of others for their success and superiority has induced us to give them another trial, and we now have 130 or more varieties nicely started in orchard, from which we shall hope to meet with better results. With a view to making this report as complete as possible, last spring I wrote to an old friend in Washington, of Dr. Jewell's, Mr. J. M. P. King (who is deeply interested in Horticulture, and in a position to learn all about the Russian apples under Mr. Saunders' care), asking him to send me, in their season, at my expense, all the samples he could of the "Russian" apples. He wrote me that if I would jog his memory in the right season he would gladly do it. Accordingly the 4th of August I reminded him of his promise. His answer was as follows:

"Dear Friend: Yours of the 4th inst. received on the day of my return to the city, and went over at once to secure your wish. Every tree, except perhaps half a dozen, had dropped their fruit. These few Mr. Saunders thought would hardly justify sending."

Mr. C. Perry, of the "Beaver Dam Nursery," Wis., wrote me, under date of Oct. 18th: I have tested 38 sorts of Russians, but so far as they have fruited they are all summer apples."

I have looked in several other places for samples of Russians that would keep, and remembering that we had at our meeting last winter a large number that had kept well, it has surprised me that I should have been so unsuccessful. Hoping the other members of the committee have met with better success, I remain,

Respectfully yours,

J. M. UNDERWOOD.

MR. SIAS' REPORT.

Mr. Sias read his report, as follows:

ROCHESTER, Jan. 16th, 1880.

Gentlemen of the State Horticultural Society:

In response to a call from our worthy secretary I will give a brief repo t on the Russian apple as found in the southern part of the State. From the most reliable data at my command, I conclude that we now have on trial in this part of the State ab ut three hundred varieties of Russian origin,—all obtained through the Department of Agriculture at Washington. Of these bu a comparatively small number have yet fruited. The greatest number reported at any one place was at Rochester Nursery, M. W. Cook proprietor. He reports having fruited thirty-six varieties the past season, some of which are earlier and superior in quality to the Duchess of Oldenburg, but all summer fruit, and nearly all hardy trees. Fruited on my own grounds thirty varieties. Have about one hundred and thirty altogether. Classed them all August fruit, except one: that is called Roursks Anisette;

season, September; size, medium; quality, fair; color, green, slightly streaked with dull red. I will say in this connection that I had expected, among so many new Russians, to find something earlier than I had ever before seen, but was disappointed in finding nothing quite so early as the Red Astrachan. A variety received under the name of Winter O'Porto ripened in August. Visited the extensive orchards of Mr. E. B. Jordon. He reports two hundred varieties on trial, generally looking well, and mostly hardy, but very few have yet fruited, and all are summer fruit. Among them White Astrachan; season, August 1st. Visited Mr. Rollins, of Elgin, Wabasha Co. He has a fine collection of new Russian varieties, quite a goodly number of which fruited the past season, generally of fair quality, and mostly hardy,—all early. The reports are so much alike from all the different fruit growers in this section that I deem it of too little interest to the Society to extend them further.

If the past season has been a fair test of the new Russians in this part of the State, then we have gleaned enough from these several reports to establish the following facts, viz.: 1st, they are mostly hardy; 2d, the season of a great majority of them is August; 3d, none of them, so far as yet reported, are winter. Every variety adopted, and put on the records of this Society, should, as far as possible, be rightly named, and its proper season indicated. Unless strongly guarded against by every true horticulturist of the State, there will be gross injustice practiced upon the unsuspecting farmer and fruit grower by the tree-dealer and peddler, more especially, perhaps, from other States, by selling these new summer and fall fruits as winter. I am credibly informed that the Alexander, raised in Ohio, and sold in this State under the name of Emperor Alexander, Russian Emperor, Czar, &c., has been sold as winter fruit, while Downing gives its season October and November; and, having fruited it myself, I can testify to the fact of its being a fall fruit. Now, many of these wise men of the East are magicians. They will strike a new summer or fall fruit with their little wand (they prefer a new name that the farmer has never before heard of) and repeat the words, "Presto change," and behold, the summer fruit is changed to winter! One of these wise men informed your committee that he had transformed our old pet, the Duchess, and made of it a good reliable winter fruit, and was about to apply for letters patent. Now, I have been diligently searching for the last twenty years, for a winter fruit that should prove in every respect equal to the Duchess of Oldenburg; and now to have the real Duchess suddenly thrust upon my admiring gaze, with all the keeping qualities of a Boston russet! Why, it makes me feel, as far as my labors are concerned, that I might just as well heve been a Rip Van Winkle as a searcher after winter fruit. Edison's great scientific discoveries are no more wonderful than this. I was conversing, not long since, with a gentleman who was formerly engaged in the nursery business in Sweden. I asked him if he was acquainted there with the White Astrachan. He replied that he was. I then asked to know its season. His answer was, winter. Now, Downing tells us in his work on "Fruit and Fruit Trees of America," that the season of the White Astrachan in this country is August 1st, and, judging from all the information that I am able to gather from the winter fruits of Sweden, I would as soon depend on the magician's wand.

At our winter meeting in Winona in 1876 I made the remark that I was skeptical in regard to finding winter fruits that originated as far north as St. Petersburg, and now, after four years more experience of my own with many of these new Russian varieties, and after gathering what information I could, as one of your committee, I am not prepared to retract anything said at that meeting on this subject. There is a greater difference in longitude than in latitude between St. Petersburg and this place. The Russian empire extends south to near latitude forty-one, some four degrees south of Minneapolis. Now the point I would like to hear discussed is, whether a variety of fruit that originated four degrees south of this, on the southern border of the Russian empire, and then brought here, would mature earlier or later, knowing as we do that there is a vast differenee in the longitude of the two places. I think you will justify me in dwelling at some length upon the season, or time of maturing of these new Russian varieties, owing to the fact that nearly all of them are likely to prove to be summer fruits, and in consequence we shall be pretty sure to be overstocked with summer apples. Some of the strong advocates of foreign varieties tell us that it will take several hundred years to get as many hardy varieties from seedlings as they now have in Russia. To all this I have just this to say: 1st. We do not need or desire so many varieties. 2d. Judging from the past history of the progress in native seedlings in the New England States and the rapid advance made in the State during the last twenty years, it will not be over a score of years, at the most, before we shall settle down on as many varieties as any reasonable man could wish, and as hardy, as good in quality and in every way more desirable than anything possible to be obtained from foreign countries. It is becoming a well established fact, that our new Russian varieties, as a rule, blossom earlier than our native seedlings, and therefore suffer more from late frosts.

After completing my report, as I supposed, and just as I was about leaving for this place, I was handed a descriptive list of thirty-two new Russian varieties from a friend in Vermont, and as it is too lengthy to embody in this report, I will merely add that it contains twenty-seven summer and fall varieties, three late fall or early winter and two winter. One of the winter varieties, Barsdorf, which is probably a German fruit, as Downing describes a German fruit by that name. The other is the English Pippin, whose name would indicate that it was of European origin. One of the late fall or early winter is called Green Crimea, whose name indicates that it was produced on an island in the Black Sea called Crimea, and on about this latitude. I will give our friends description of this fruit and close, viz.: Green, conical apple, of medium size, keeps into December, and is the meanest tasting apple, without exception, that I ever bit.

Very respectfully submitted.

A. M. SIAS.

Mr. A. W. Latham, of Excelsior, was not present and forwarded no statement.

PRES. GRIMES' STATEMENT.

Pres. Grimes made a statement, as follows:

I believe I was a prime mover in this matter. I wished to know what the much-talked-of Russian apples amounted to. Thought I would make a full report, with his permission, on the Russian apples, in Mr. Moulton's nursery. I saw the fruit on the trees when some of it was beginning to ripen—at about the time of the Tetofsky. Took an apple and made diagrams of its sections. Went again and told Mr. Moulton my plans for making a full report. He said he was then in a hurry, but would be at home at almost any other time, and would give me any assistance he could. Told him I wanted 3 specimens of each as they ripened: one to make outlines from to test its quality, and one to see how long it would keep. The next time I went Mr. Moulton was not there, but I found Mr. Spaulding, the superintendent, who said he would show me the trees and fruit, but said they could not furnish any specimens because their agents were out selling trees, and they had not fruit enough to send them for specimens. I found that I did not know anything about fruits. Thought I saw the familiar fruit called the Duchess, but was informed that it was not. The trees had certain numbers assigned by Mr. Moulton, and which bore no correspondence to the original numbers. On the whole, I met with great discouragement, and gave up the task of making a report. Mr. Moulton said he had received but few of them from the Department of Agriculture, but had imported direct from St. Petersburg. Later I asked Mr. Moulton to make a report for this meeting, but he declined, saying that if he described those fruits every member of the society would have them to sell next year.

Mr. Jordon. Mr. Moulton has a fine collection of apples. There are many poor ones, but some also that I think will be valuable. No. 20 of his list is one of these.

Mr. Dart. I rise to a point of order, that Mr. Moulton refuses to have his apples reported upon, and I think we have no right to do so.

REPORT OF DR. HUMPHREY.

Dr. Humphrey. In 1874 I received two bundles of cions, top-worked on Transcendent crabs in the spring. The same season the blight nearly destroyed the stocks but they afterward partially recovered. Some of the varieties are promising in habit of growth, while others are smaller than dwarf. Most of them have been hardy—entirely hardy—starting from the terminal bud. Of forty sorts not more than three or four are worthy. They are catalogued as—

First. Lubsk Queen, a very beautiful, smooth, medium-sized fruit, of brilliant color, and very early; a tart, sub-acid, excellent for cooking, well flavored and finely grained, but a little acid for the table to most palates.

Second. Red Anisette, a late fall sort, very fair and handsome, medium size, fine grain, a very prolific bearer; but with rather dwarfish growth as grown, rather acid but well flavored.

Third. Noble Red Streak, a large round, slightly flattened apple, greenish white, abundantly striped with red, a little coarse, but juicy and tender; best for cooking; growth of wood very strong and vigorous; season, medium to late fall

Fourth. Juicy Burr, much like the last; season the same, but still larger, good specimens weighing a pound; wood, stocky and strong. None of these have shown the slightest injury from the winters, and are as free from blight as the Duchess of Oldenburg. Of other varieties fruited, many are good fruit but mostly early and perishable. About the season of Duchess of Oldenburg, somewhat like that sort, and not superior to it in any way.

Mr. Fuller. A member of the Western New York Horticultural Society thought that the large number of Russian varieties might be only for types of which the Duchess and Astrachan are the chief.

Dr. Humphrey. I would say much the same from my observation.

Mr. Dart. I have noticed strong similarity in my Russian trees to trees already familiar to me.

Mr. Jordon. I am confident that there is not a single old variety among the Russians that I have seen.

REMARKS OF GEN. LE DUC.

Hon. Wm. G. Le Duc, Commissioner of Agriculture, having accepted an invitation to be present at the meeting, was called upon and made the following remarks upon the subject under discussion. He said:

GENTLEMEN: It gives me much pleasure to be present at your meeting, and especially this afternoon, which is devoted to the discussion of the Russian varieties of apples, a large number of the cions of which have been distributed by the Department of Agriculture, especially throughout the Northern States, where it was hoped and expected they would find a congenial soil and climate. Of the 290 varieties of Russian apples imported by the department and grown and fruited in the grounds at Washington, there are not more than the usual proportion of first-class fruit trees in the locality of Washington. We sent out nearly 100,000 cions from these trees last year and 60,000 to 70,000 during 1878, until we have the report of parties who have given these cions attention in various sections and under various circumstances. I had expected and am glad to find that I will not be entirely disappointed; that the results of previous distributions would be discussed here and possibly the fruit exhibited. There are no reports on record from those to whom cions were sent some years since, and in this matter allow me to say that there is too much negligence in the matter

of report. Unless this is done the Department of Agriculture cannot intelligently perform the duties imposed by law upon it.

It is well known to you all that you can only find out the quality of fruit in your respective localities by growing the trees and fruiting them. Trees that may bear good fruit in Washington may and probabl would change materially in the character of fruit in Minnesota. Hence, the importance of growing whateve fruit tree you may find hardy enough to endure the rigor of our northern climate. And if among all the cions distributed by the Department in this State you obtain but one fruit tree of superior merit, it will repay a thousand times all expenditure made by the government to secure this end.

Of the 290 varieties we find in the latitude of Washington no large number of these that we think would be worthy of cultivation there, but there are some few exceedingly pleasant, among them one remarkably early and pleasant to eat. All that the Department of Agriculture can do for you in this matter is to procure and distribute the cions of those trees that may be hardy and good. It is for you to try them and make report upon them; and if I can find out from this discussion, or through correspondence with the members of your society, the varieties that do the best with you, I shall certainly take pleasure in sending them to you.

In answer to the question of a member, he said:

You know that in the climate of Washington, which is damp and very different from the dry air of Minnesota, apples, in common with most other green fruits, decay rapidly. No tests have been made during my connection with the Department of the keeping qualities of the different Russian varieties; at least none that will warrant us in recommending any of them, especially for their long keeping.

Dr. Humphrey. (In answer to question.) Suppose I have 40 varieties already fruited.

Mr. Harris. The reports are not so far very promising. I have five varieties now doing very well. Think it would be well to continue the committee on this subject.

Motion was made and carried to continue the committee with the same members.

Mr. Fuller. Two years ago I received 15 to 20 Russian varieties which I put in as root grafts. These look well. Last year 40 to 50 more came very late for grafting. These I top-worked on the Hyslop, but only a few have survived.

Gen. Le Duc stated to the members of the association that if there was any of them who desired to try the grafting cions of the Russian stock, he would take pleasure in sending all that might be wanted.

Mr. Pearce. I have faith in Russian apples, but the cions should come from the same latitude as ours. St. Petersburg is 16° north of this.

Mr. Smith. It should be remembered in Dr. Humprey's case that the cions are on Crab Stocks, and if they failed in this case it would not be conclusive against them. I had some Russian cions on Hyslop that produced some very fine fruit, ripe in September, but blight has killed the tree.

Mr. Jordon. Last spring I used Duchess to top-work Russians upon. They have done finely. The Duchess were on common apple roots set deeply so that roots issued from the Duchess stocks.

On motion the discussion on Russian Apples was closed.

During the above discussion the Council had been in session in their room and the Horticultural Society had occupied the Board of Trade Room. The society now returned to the Council Room.

MR. FORD'S PAPER.

Motion was made to dispense with the regular order, which motion was carried.

L. M. Ford read his paper on the "Advance of Horticulture in Minnesota."

DISCUSSION.

Distribution of Cions.

The paper was ordered on file for publication, and the subject opened for discussion.

Mr. Harris made some further retrospective remarks, and stated some encouraging aspects. He suggested that members of this society forward to the Commissioner of Agriculture the names of those who will set and take care of cions. They will then do more good than to send them to nurserymen, who will lock them up away from the people when they get them.

Mr. Jordon. Think not much good will come by sending cions to farmers. They have no facilities for grafting, and will neglect them.

Mr. Sias. I think Mr. Harris is a trifle hard on nurserymen. These cions in the hands of farmers generally would be neglected and come to naught.

A Member. I want to hear the nurserymen talk. They are studying these questions, and I want to hear what they have learned.

Mr. Eldridge. I am a fruitgrower and farmer, and do my own grafting, and will be glad to get some of the Russian cions.

Pres. Grimes. I would suggest that the cions be sent to the secretary of this society to be distributed.

Col. Stevens. I received from Commissioner Watts a large number and distributed them, but Dr. Humphrey is the only one I know of that has succeeded with them.

Pres. Grimes. Those are all grown by top-working, and when we get them from root-grafts we shall get a different story.

SEEDLINGS.

MR. DAY'S REPORT.

The reports of Committee on Seedlings were then called for and made, as follows:

D. Day made a verbal report, and asked leave to make a full written report describing fruits. Leave was granted, and the report ordered on file.

FARMINGTON, April 30th, 1880.

C. Y. Lacy—

SIR: I am aware that I promised to put my report on seedlings in writing within a few days or weeks, but poor health immediately after my return home prevented me from writing until I thought it would be too late for this year's Transactions, so I gave up the idea of writing, and now have mislaid what little report I did make, and will have to refer to the minutes I took at the time of examining the trees, &c. Hoping that this will be some aid in making up Transactions, &c.,

Respectfully yours,

DITUS DAY.

To the Members of Minnesota State Horticultural Society—

As one member of a committee on seedlings, I would make the following report, which must be very brief, as I have not had opportunity of examining trees in any part of the State except in my immediate vicinity:

I found two trees in Eureka, raised by Mr. Pool: one a red apple, sour; season, early winter; size, medium; tree semi-hardy. The winter of '73 and '4 injured it a little (not much.) The other is a white, sweet apple; size, medium; good baking apple; keeps till February; tree hardy. The winter of '73 and '4 did not injure it. It measures 25 inches in circumference at the ground. Both trees are 16 or 17 years old.

I found a tree in Lakeville on the farm of Caleb Smith, one mile from Farmington. Tree an upright grower, is 24 inches in circumference one foot from the ground; was raised from seed sent from near Claremont, in New Hampshire, in 1860, and is the only tree left of 800 or 900. This one seems to be hardy—the winter of '73 and '4 did not injure it—has borne 5 or 6 years; bore near a bushel the last year; apple the size of the Baldwin, an early winter apple, somewhat tart.

The large apples I have here were raised by Wm. H. Johnson, of Castle

Rock; the apples have been kept till March, and still sound; tree 10 or 11 years old; came up of itself; has borne 3 years; the winter of '73 and '4 injured it a little on the south side, but is now thrifty, and seems to be doing well. Mr. J. showed me some cottonwoods and soft maples that were injured the same winter like the apple tree. These light-colored apples are the same kind that I took to the winter meeting in Rochester, in 1878, and was named Clara; the tree is 13 or 14 years old, and has never been injured yet. I have kept the fruit till May. The tree is an upright, rather slow grower, and has borne five years.

These apples were raised by my brother, A. A. Day, and were brought here for a name. Does not know whether they are seedlings or not.

I have seen the fruit of a seedling called the Myers' seedling, raised not far from Hastings—have not seen the tree. The fruit is a large fair apple. cannot say as to its hardiness.

I am promised specimens of the fruit of the three first-named trees for exhibition at our next meeting. All which is respectfully submitted.

DITUS DAY.

REPORT OF MESSRS. GOULD AND FULLER.

Mr. Gould had made no report because although he knew of trees of some age, they had seen no winter to test their hardiness. He made some remarks, however, upon some trees with which he was acquainted, and a motion was made and carried that these remarks be put in writing for the Transactions.

EXCELSIOR, MINN., May 7th, 1880.

DEAR SIR: Your card in reference to report on seedlings to hand, in reply I would say that owing to the uncertain condition of trees after the severe winters, and at the time report should have been made, it would be as well or better to let the matter rest until next winter's meeting. Am sorry if I have caused any delay.

Truly yours.

F. G. GOULD.

Mr. Fuller had no report to make because of absence from home when observations should have been made.

REPORT OF MR. PEARCE.

Mr. Pearce reported verbally on the Kimball and Claysen, and promised to write a report for the Transactions.

MINNEAPOLIS, MINN., May 2d, 1880.

Report of M. Pearce, one of the Committee on Seedling apples.

At the meeting of the State Horticultural Society I made a verbal report of a few seedlings and was requested to reduce those rmarks to writing for publication, I will endeavor to do so.

The first is the Elgin Beauty. Was grown by Mr. Rollins, of Elgin, Wabasha County, Minnesota. The tree is a marvel of hardiness. About the middle of last February, Mr. A. Sias, of Rochester, of this State, who has grown this variety for several years, cut and sent me a thousand cions of this variety; to all appearance they were in a perfect condition; I grafted them and they are all growing. The trees are growing on the State University ground; and from close observation I am of the opinion the Elgin Beauty is more hardy than the Duchess, Wealthy or any other standard varieties. Fruit,—medium size, striped, sub-acid, of good quality, keeps till March.

Rollins Pipin,—another variety originated by Mr. Rollins, and grown by Mr. A. W. Sias, of Rochester; tree a good grower, and as hardy as Duchess or Wealthy; fruit, medium, dark green; very smooth; sub-acid; of an excellent quality; better than the Wealthy; keeps till February or longer.

Clawson Apple originated in Wisconsin more than forty years ago. Four sprouts from the original tree were planted in Olmsted Co., this State, over twenty-five years ago, by Mr. A. Clawson, a son of the originator, and in spite of gross neglect, browsing, bad location, hard winter, and barking with the whippletree, they are still alive, have borne heavily alternate years for fifteen years to my knowledge. I received cuttings from the original trees this spring,—all green. The fruit has the appearance of the yellow Bellflower,—more juicy, and less tart; a good grower, and early bearer.

Kimball Apple grew from seed in Olmsted County, Minn. Tree twenty years old, free from blight, and apparently as hardy as Duchess or Wealthy; a poor orchard tree, but good for top-working; fruit, medium, striped, and of the very best quality; keeps all winter; sub-acid.

I also wish to call the attention of the Society to Powers' large, red crab, introduced some fourteen years ago by A. W. Sias, to this State, from N. Y. I think it is the best of all the crabs; perfectly hardy; free from blight; a good bearer; ripens just as the Transcendent; is good; about the size of the Transcendent; and, for cooking or eating, can't be beat.

REPORT OF MR. HARRIS.

Mr. Harris read his report, which was placed on file, and was as follows:

But few seedling apples possessing any great merit have come under my notice since our last meeting. In March last, about the 10th, I received from D. K. Meshener, Etna, Fillmore Co., samples of a variety that is doubtless a seedling. It is rather under medium in size, yellow, with red cheek, flesh firm, juicy and pleasant, sub-acid flavor, and from the samples I should think the season to be from March to May. They bear a striking resemblance to the Tewksbury Blush. Mr. Meshener writes that the tree was somewhat injured in the winter of 1872-3, but stood the winter much better than any of the hardy varieties except the Duchess, and has since entirely recovered, and is bearing full crops. He says the tree has been neglected because a seedling, but is a thrifty, compact, upright grower, but not a very early bearer. Is now 20 years old. I have also received from John Turnbull of La Crescent, samples of a very fair seedling Sweet, about the size and

quality of the Tallman. I have not had an opportunity to examine the tree, but it has the reputation of being hardy. From appearance I should judge the fruit possessed good keeping qualities. In August last I spent a day in the town of Hokah, looking up seedlings, and found in the orchard of Geo. Hartman twenty or more varieties in bearing. I should judge the trees to be from 16 to 18 years old, and about half of them do not show any marks of ever having been injured by severe winters. Two or three varieties produce good and showy apples that will keep well into the winter, and are certainly worthy of being put on trial. Mr. Hartman has since deceased, but doubtless cions of them could be secured.

On my own place several new seedlings have fruited. One apple, which is designated as No. 44, has the appearance of being a hardy tree; fruit, medium size; season, late fall; use, desert. Another, No. 40, is a seedling of the Transcendent tree; vigorous and hardy; fruit about the size of Fameuse; mild, sub-acid; keeps until New Year; and I think the tree is as hardy as the Siberian. Other varieties may prove more encouraging at the next fruiting. I also received from Richland Co., Wis., four varieties said to be seedlings of Siberians. They were all somewhat larger than Transcendents, and for most purposes three of them are better. They are named Wisconsin, Monmoth, Sweet, Richland, Winter Sweet, Lookers Winter and President Hayes. I hardly think any of them can be relied upon for keeping all winter, but perhaps ought not to form an opinion from last season's fruit. Doubtless they will be valuable to make up variety for family use in those regions where the apple can not be grown, but are of no great value where it can.

Hart's seedling strawberry still continues to promise well, and is not only a good fruit but very hardy and vigorous in the section where it originated.

I have seen the new seedling grape, Beauty of Minnesota, in fruit the past season, and am very favorably impressed with it. The vines were thrifty and doubtless hardy, as Mr. Kramer says they were not covered the previous winter. The quality of the fruit is better than the Concord, growing by the side of it. The bunches are large and compact, often shouldered, and the berries adhere well to the stem, and it keeps a long time after gathering, which, together with its being a white grape, will make it a favorite for market.

I have six varieties of Picket's seedling apples on trial. The trees show some good points but have not yet fruited. I have heard of several other seedlings in this vicinity and am satisfied that some of them are worthy of being looked after. I would recommend that the committee on seedlings be a standing committee, comprised of men who have the facilities for giving new varieties and seedlings a fair trial, and that all new varieties should be introduced to the State Horticultural Society through this committee. There ought to be three or more experimental stations in the State where all new candidates for favor could be placed on trial and their merits ascertained before they are endorsed by this society, and the committee on seedlings could very properly superintend such experiments. We would also recommend the adoption of a rule of ten points to govern the above committee in the estimate of seedlings.

Respectfully submitted by

LA CRESCENT, MINN., Jan. 1, 1880. JOHN S. HARRIS.

REVISION OF APPLE LIST.

The discussion on Seedling Apples was passed over, and revision of the apple list was taken up.

Mr. Harris moved that the apple lists stand without change, which was seconded by Mr. Pearce.

Mr. Dart moved to amend so as to take up and vote on each variety. The amendment was carried.

"*General Cultivation.*"

The first list Duchess and Wealthy, for "general cultivation" was voted to stand unchanged.

"*Planting in Limited Quantities.*"

The second list Tetofsky "for planting in limited quanties" was voted to stand unchanged.

"*General Cultivation in Favorable Localities.*"

Under the third list "for general cultivation in favorable localities" the following votes were taken:

Motion was made to retain the Haas, which was carried—16 for and none against.

Motion was made to retain Plumb's Cider, which was lost—5 for and 6 against.

Motion was made to retain Price's Sweet, which was lost—6 for and 8 against.

Motion was made to retain Saxton, which was lost—none for and 7 against.

St. Lawrence.

Motion was made that St. Lawrence be added to this list.

Mr. Dart. There is no money in it. Trees ten years old have borne no fruit, and are in bad condition.

Mr. Gould. They used to bear about here, but I know of none now, so I suppose they must be dead.

The motion was carried—8 for and 5 against.

"*Favorable Localities in Southern Portions of State.*"

The fourth list, Fameuse, Utter's Red, and Talman's Sweet "for favorable localities in southern portions of the State" was voted to remain.

"General Trial Throughout the State."

Under the fifth list "for general trial throughout the State," it was moved that Rollins' Pipin be added, which motion was carried—15 for and none against.

Peach Apple.

Mr. Jordon. Have raised fruit from the Peach apple for three years. The fruit is later than the Duchess, large as the Ben Davis; looks like a peach, but it does not keep. The tree is about as hardy as the Duchess, and is but little liable to blight. It does not bear young, but bears well when it comes into bearing.

Mr. Storrs. Mr. Gideon has had it in bearing several years, but says it is a shy bearer.

Mr. Harris. Have seen the tree. It is hardy, but does not come into bearing early.

Mr. Sias. I believe it is a shy bearer.

Dr. Twitchell. My neighbor has them, and they fruit about as soon as the early strawberry.

Motion was made to retain the Peach apple on this list, which motion was carried—10 for and none against.

Japanese Persimmon.

Gen. Le Duc called the attention of the members of the Society to a new fruit—the Japanese Persimmon—which the Department is distributing for trial, and which he thought might be successfully grown in the greenhouse here.

The Society then adjourned, to meet at 7.30 P. M.

WEDNESDAY EVENING.

The meeting was called to order by President Grimes at 7:30 o'clock, and reports of standing committees called for. None were offered. The secretary then read some letters he had received.

LETTER FROM HON. L. B. HODGES.

The first from L. B. Hodges, as follows:

SAINT PAUL, January 20, 1880.

Friend Lacy—

I am compelled to disappoint you. I have more than I can do. Work has been crowded on me within a week that could not well be postponed.

This morning I thought I would try to put in this day on the paper I promised you, but the mail-carrier brought me fourteen letters to-day to answer soon as possible. These, with others I have been compelled to lay by for a few days, together with doing up, addressing and mailing over "150 Manuals" will keep every moment's time not necessarily needed in open air exercise, fully employed the next three days. I can only add, if the paper you called for will be of any service later, I could prepare it in time for publication in "Transactions" for 1880.

Yours truly,

LEONARD B. HODGES.

Mr. Elliot. I move that we request Mr. Hodges to transmit his paper to the secretary, and that it be published in the Transactions of the Society. The motion was seconded and carried.

LETTER FROM DR. WARDER.

The second letter was from J. A. Warder, as follows:

NORTH BEND, OHIO, January 17, 1880.

MY DEAR SIR: Your timely and cordial invitation was, I thought, acknowledged, but find no record. I now thank you and your associates, and regret that I am denied the pleasure of being with you next week.

Other engagements, and increasing laziness, have prevented my writing more at length for your meeting something relative to the great interests you will have under discussion.

Present me most cordially to all the good folks I should have been so glad to meet and take by the hand. Believe me their and your friend and co-laborer,

WARDER.

The third letter was from John Hart, as follows:

LETTER FROM JOHN HART.

WATERTOWN, D. T., Jan. 17, 1880.

Prof. C. Y. Lacy—

DEAR SIR: Your letter and also programme of the coming meeting is received. Although we are now in a treeless country on the open prairie, and advanced in years as we are, we hope to raise some fruit, although not as much as we raised among the bluffs in Winona county, where we had last

summer the best crop for many years, so far as apples and small fruit. We have with us a few hundred of the hardiest varieties of apples and crabs, which we intend to try here, and hope to be able to report to you in some future day the result. The pro-pects are good here, for wherever we found a bush or shrub here we found the native plum, raspberry and strawberries. Speaking of strawberries, I noticed in your last report that some member wished to know what our Minnesota strawberry was a seedling from. I would say that several years ago we picked the largest berries from a patch containing twenty varieties, took a few seed from each, dried them in the usual way and sowed them, from which we raised a great variety of berries. All were worthless except two varieties. The Minnesota Seedling is the best of those two. We will leave that variety to your members; as for ourselves we think it is one of the best varieties grown.

Yours respectfully,

JOHN HART.

LETTER FROM J. C. KRAMER.

The fourth letter was from J. C. Kramer, of La Crescent, and referred to his seedling grape, as follows:

LA CRESCENT, MINN., Jan. 18, 1880.

Gentlemen of the State Horticultural Society:

Herewith I send you for examination a small box of my new seedling grapes, which I call the Beauty of Minnesota. Those sent you have been kept in sawdust until three weeks ago, since which time they have lain in an open box. I have some in the same condition that were packed in old straw. By good care in packing the fruit will keep until spring. While I cannot be with you, please give the fruit a careful examination and report. Should any of you wish to buy plants, send for circular to my address.

Respectfully yours,

JOHN C. KRAMER.

The Secretary stated that he had some other letters containing points that would involve discussion, and if it were the pleasure of the society to defer them to some other time he would not read them then.

Mr. Harris. I move that they be deferred till to-morrow, and take the place of Mr. Hodges' paper. The motion was seconded and carried.

PREMIUMS AT FAIRS—DISCUSSION.

Mr. Gould. Have noticed that there was considerable complaint about the small premiums and the small *number* of them on fruits at the last fair of the Agricultural and Mechanical Society. There were more and larger premiums offered for flowers than there were for fruits. This seemed wrong to me, but it was none of my

business. Immediately after the fair I had a conversation with some of the officers and was told that larger premiums would be hereafter offered on fruits. In view of this I would move that two committees, one composed of florists and the other of fruit growers acting as one, be appointed to arrange a premium list with the proper committees of the Agricultural and Mechanical Association.

Mr. Harris. I object to this motion. In the first place this society, being a State society, has no business as a society with the Minneapolis fair. In the second place, the greatest attraction at the fair are the flowers. It takes great trouble and care to get them there, and the exhibitor often has to spoil a beautiful flower bed and lose some valuable plants. Hence the flowers need as liberal premiums as do the fruits. If we have the right to dictate at one place we have the right to dictate at another, and if we should go to the St. Paul fair with our petitions, I am pretty sure they wouldn't be granted, and I think they wouldn't be granted here. Think it is better to drop the matter as a society and make our requests individually.

President Grimes. The motion is not seconded, and hence is not up for discussion.

The Secretary. I second it for the sake of the discussion.

Mr. Gould. We needn't go into this matter as a society. We will exhibit individually, but while we have an opportunity to do something for the fruit-growers we ought to make the best of it.

Mr. Brimhall. Inasmuch as there were no worthy premiums offered for fruit, I am in favor of this motion. We do not want to go to the trouble of making an exhiblt of our fruits, and then get no pay for it. We want some reward for our labor.

Mr. Harris. Have no objections to these remarks, but under the present circumstances we are in duty bound to stand by the State Agricultural Society.

Pres. Grimes. Wouldn't it be better to refer the question to a committee?

The Secretary. Think it would be better to leave it with the present executive committee.

Mr. Brimhall. Our society fixed a premium list last year that was favorable to both florists and pomologists. If we can get a guarantee for the payment of premiums, I am in favor of adopting that list and submitting it to the fair associations.

Mr. Gould. I claim a vote on my motion. I want the sense of the meeting on it. The object of the two committees is to

have one that knows something about flowers, and one that knows something about fruit.

Mr. Dart. Move that we have a division of the question.

Mr. Gould. I accept it.

Mr. Gibbs. Would alter the motion so that it would include State fairs, and would add a proviso that this committee confer with those of the fairs, provided they are willing to consider our lists.

Mr. Harris. The Minnesota Horticultural Society stands on a firm basis. But we sometimes have united our fortunes with things unsafe. It would be good if we could have something to give us security for our premiums. I don't believe in going beneath any other society. We should make a motion that will *demand* certain terms. Our business is moral, elevating; that of the Agricultural Associations, with their racing, and gambling, is demoralizing. I think it is wrong to spend thousands for those who undo our work.

Mr. Brimhall. Men received $125 for fast horses. Fruit-growers received nothing.

Mr. Pearce. Think it was our own fault. Nobody took a hold of the matter. And I think it is best to leave the matter alone now. Next year a committee will be appointed. If we had arranged these things with the officers of the association we would have gotten our premium lists to suit us.

Mr. Dart. We had a convention of florists and horticulturists last winter for fixing up a premium list. There was a contention between the florists and horticulturists in fixing the premiums. The florists contended his flowers demanded more than the fruit, and the fruit-grower contended his fruit demanded more than the flowers. Flowers are nice. I have nothing against them. They look pretty, but so do our apples, and the apple blossom is as pretty a flower as those of the florist. The flowers smell good, so do our apples, and they taste much better. And, besides, they are beautifying, they are conducive to health. We have also taken a great deal of trouble in bringing them out. It may be best to give flowers a good share, but not the lion's share. Believe the best for men and societies to do is to do the best they can. Nothing that is wrong, but all that is right.

Mr. Gould. Hadn't the least idea, when I made this motion, that it would arouse the feelings it has. Am willing to have the resolution amended so that it will contain all necessary points. The reason for the two committees was that one be composed of

florists,—persons that can decide on questions concerning flowers, and the other of fruit-growers. Haven't liked the way in which this matter has been managed heretofore.

Mr. Elliot. Can't see the need of an executive committee if we don't give it any work. We had better dispose of it to-morrow. Think the executive committee can take this matter into its hands and fix up a premium list in as good a shape as any other committee can. Think a committee composed of florists and horticulturists can be appointed out of this meeting that will do satisfactory work this year.

The Secretary. Think that any committee appointed by this Society will represent the Society. Can't see that we can appoint a committee that will not represent the Society. I feel the force of appointing two committees, but don't feel like appointing any committee that feels less responsible than the executive committee. Think that every committee appointed ought to feel as responsible as the executive committee. I would therefore amend the resolution by moving "that the executive committee be requested to confer with the State Associations, holding fairs, with reference to premiums to be offered for fruits and flowers at said fairs." Amendment was seconded and carried. Motion, as amended, was then carried.

ADDRESS OF PRESIDENT GRIMES.

The Secretary. Move that we proceed with the regular order. The motion was seconded and carried.

Vice-President Dart was then called to the chair, and the President delivered his annual address, as follows:

Ladies and Gentlemen—Fellow-members of the State Horticultural Society of Minnesota:

I have sometimes thought that our first parents acted wisely when they partook of the fruit of the tree of knowledge, not that they became gods or angels, but fell (if you please) from their first estate back upon their own resources, with very little knowledge of the world around them. But knowledge increased, very slow at first for want of capital, but like a penny at interest, compounded. It did increase nevertheless, little by little, year by year, century by century, age by age, with the ratio of time until it became the motive power of the world. Life is too short, knowledge too vast, for the human mind even to comprehend all that the world has treasured up. In the progress of time new arts have been discovered, science has been developed, facts have been demonstrated, and discoveries have been made in every branch of learning still more perfect and complete, and such will still be the case as long as our institutions of learning are fostered and

maintained. We must be content to know little, for the human mind can grasp but little of the vast treasure that has been laid up in the storehouse of knowledge; therefore, if we would become proficient in anything, we must take some particular specialty and pursue it. Yours, gentlemen, is Horticulture.

Fruit Lists.

In view of our progress as a society, let me first refer to our fruit lists, which have been revised and corrected from year to year as experience has seemed to dictate, until from a very small beginning that could be relied upon, we are now successfully cultivating over fifty varieties of standard apples, saving annually thousands of dollars that would otherwise be expended in the importation of apples alone, to say nothing of hybrids and crabs, which are perfectly at home throughout the State. Our experience also demonstrates the fact, that small fruits, such as grapes, currants, gooseberries, raspberries, strawberries, etc., can be profitably and successfully cultivated. But this is not all; our attention has been given to the adorning of home grounds, lawns, cemeteries and tree planting upon the prairies, with instructions in regard to varieties suitable for different purposes, localities and soils, together with a list of hardy shrubs and flowers to adorn the immediate surroundings of home. And we find that our people have not been slow to act upon our suggestions and profit by our experience. Fruit is no longer regarded as an article of luxury on account of its "far fetched and dear bought" qualities, but is justly esteemed a necessary article of food on account of its nutritious and health-giving qualities. It should be planted wherever the occupant is rich enough to own an acre of ground. Refinement, then, comes in with all her train, call it whatever you please, I call it taste displayed, where tree, shrub, flower and lawn combine in harmony to blend without the aid of "distance to lend enchantment to the view." What surer index to the cultured minds within those homes than here portrayed; where nature pictures by artistic hands draws out her colorings and mocks the artist's penciled skill?

Horticulture in Waste Places.

There is one particular subject upon which I should like to dwell, and which for the want of a better name I shall call horticulture in waste places. A very large area of our western domain is one vast unbroken treeless plain, over which the winds sweep with gathering force and storms hold high carnival. Congress has wisely appropriated those lands to the tree planter to make himself a home and to protect it from the cold, fierce winds that come out of the north, and from the heat of the summer's sun. But how often does he mistake in the selection of varieties suited to the climate and soil of his particular locality? How often does he find after many experiments and the loss of much valuable time, his labor spent almost in vain? Would it not be well for him to enquire what trees he will plant that would grow and make valuable timber and yield the quickest returns? Then we have other waste places, some gravelly knolls for instance, which will not produce grain or grass sufficient to pay for cultivation. The European larch thrives in all soils not positively wet; it is one of the most rapid growing and durable of timber trees, and I think worthy

of trial at least by all tree planters. And there are marshes and swamps, some of them not susceptible of being drained, which produce neither trees nor grass, and present nothing but a mossy surface upon a peat bottom. These places are the natural home of the cranberry, which, with but little care in planting may be made valuable. But need we stop here? Are there not other waste places that come nearer, I had almost said home? where gates and doors hang on a single hinge ajar and the woodpile spreads over an acre of ground and geese in melodious concert keep time, to the musical grunt of the hog; where nothing tidy stops to stay, no lawn, tree, shrub or flower. I will not dwell upon a picture like this. It is our business to refine and elevate, to bring out all that is lovely in itself and pure in its nature. We must cultivate in our children a love for flowers. Purity goes with the violets and the roses. No boy or girl can love to watch the unfolding of leaf and bud, and be rough and coarse. It is also our business to show what is practical as well as possible. Some things may be done which are a novelty in their way but of no practical value; for instance, the apple or the pear may be grafted upon the mountain ash or thorn and be made to grow and even bear fruit, but can we depend upon such stocks as a permanent foundation for an orchard? It is even questionable if any of the Siberian species make a suitable stock upon which to graft the standard apple. There are many questions connected with orcharding that we have yet to determine. The time is fast approaching when that vast domain to the west and northwest of us will be ready to draw upon us for their fruits. Will we be ready to meet the demand? Or shall other States more remote receive the profits that would naturally belong to us? Shall we then be importing for our own use as we are now? It is true that we have made some progress in this department of horticulture; but it is only the beginning of what we shall yet accomplish. We claim the Wealthy apple of Minnesota origin, an apple more inquired and sought after abroad to-day than any other. There are other seedlings of equal value still coming forward, to say nothing about the thousand and one Russian varieties sent out by the department at Washington, which, when properly tested, may add something valuable to the lists.

I recollect that twenty years ago Dent corn would not mature here; but by selecting the earliest for seed each year it has become so well acclimated that it is now planted with the almost absolute certainty of ripening. Cannot we plant the seed of our best seedling apples with similar results; always selecting from the hardiest in wood and the best in fruit?

Dissemination of Horticultural Knowledge.

Next in importance is the dissemination of horticultural knowledge among the people, and instead of withholding our printed transactions for the benefit of our society alone, why not distribute them judiciously by our Secretary to persons interested in horticulture who would read them and consequently be led to take an interest in our work? Would it not build up our society much faster than under our present system and its usefulness be increased in proportion? With a narrow-minded policy one seldom succeeds in any undertaking. After the distribution has been made according to law, a large number of copies still remain as rubbish in the office of the Secretary of State. Why should they not be turned over to our society at once, where

they could be made available in many ways? They could be exchanged with the Agricultural and Horticultural Societies of other States for similar works of theirs, and thus form the nucleus of a library which we very much need. They could also be made use of as missionary tracts to enlighten a certain class at our own doors: for there are thousands who have been educated only in the epicurean department of taste, and who regard the beauties of the rose as inferior to that of the cauliflower. They could also be used as emigration tracts to show the resources of our State in the production of fruits. Each State is endeavoring to produce not only the necessaries of life, but to have a surplus for export by which the balance of trade is maintained in her favor. A gentleman from Maine was asked what do you grow down in your State? We grow men; and by the way, ours is the best State in the union to emigrate from. Now, while our State is sending her immigration documents broadcast to inform the world that we grow wheat by the million bushels to be manufactured in our own mills of a hundred run of burrs, that no other country in the same latitude can mature corn to perfection equal to ours and produce half the amount. While you are telling the Englishman that the luxuriance and richness of our grasses will fatten a thousand cattle upon a hill, the Irishman that we grow a mighty heap of potatoes, the Frenchman that our soil produces abundantly of oil and wine, and the Dutchman that it is a land flowing mit sour krout and larger beer, and that all we can possibly need is a famine in some other part of the country to realize good prices and a ready market for all our surplus products. While you are making known all these truths, let it also be known that we can grow fruit and men. A few copies might also be used for the benefit of some of our eastern friends who have never verged from around the old hearthstone of sacred memories to gaze upon the wide, open world beyond, but still think they occupy the very centre of civilization, and need not go very far toward the setting sun in order to approach him who is next neighbor to a savage. In proof I have but to name a friend of mine residing right here in Minneapolis, who a short time since visited the home of his nativity, way down in that old time honored State where wooden nutmegs used to grow, and was stopping with a pious deacon, who, in all the simplicity of his heart, besought the Lord in family prayers to bless his friend from the far distant West who had so little opportunity of hearing the gospel preached. But times and things have changed, and this once vast wilderness is now beginning to blossom as the rose. No wonder our eastern friends express surprise, when once they see what otherwise they could not believe, except some genii through some magic skill, had worked his way with giant power; but no, it could not be, there is a race more potent still, a race of heroes with unconquered will. Look at our mills, factories, workshops, school houses, churches, and farms that have sprung into existence on every hand within the last half score of years. But what has horticulture to do with all this? Much in many ways. She lends her tastes to every laudable enterprise to beautify and adorn, and none can be complete without her aid. Hers is the wreath that encircles the brow, the jewel that sparkles in the crown.

Nurserymen.

It is said by some that this Society has been run in the interest of the nurserymen. Suppose, for the sake of argument, we admit that it has;

what then? Are they not a part of us, and have they not erformed their part faithfully and well? Where would this Society have been to day without them? Who, in this broad commonwealth, would have devoted their time and means so persistently in experimenting upon and bringing out things that are useful in themselves and beautiful in their nature, fruits and flowers, hardy to withstand the vicissitudes of our climate through all the extremes of heat and cold? And now, for the sake of a few croakers that have taken but little interest in our work, shall they be sacrificed upon the altar of this Society, as they have already been made a burnt offering, as it were, upon that of the State? Of all the producers within her borders they are the only ones that pay a direct tax upon their growing crops. When the assessor goes abroad in the land, he smells the nurseryman afar off, and pricks up his long ears. In vain you may tell him that your stock has been much reduced, and consists largely of cullings that must go to the brush heap; but you cannot convince him in that way. He sees a value to everything, and it must be made good to the State. Why is it that the nurseryman should be taxed, while tramps and tree peddlers go scot free? Are not his sins already more than he can bear? But it is not my purpose here to extol the beauties of wise legislation. I had rather dwell among the flowers,—those little stars of earth that were snatched by angels' hands from the wreck of Eden and transplanted along the exiled paths of Adam, to cheer him on his lonely way, to restrain his affections, and eventually to bring back his weary wandering feet to his father's house again. Breathes there a soul that does not feel the refining influence of flowers? If so, to him paradise is lost! Scarce has winter's beautiful snow began to disappear ere its more beautiful namesake rears its pageant head and sheds its perfumes abroad—

> Free as the air our lungs inhale,
> Pure as the odors of the gale
> Of spicy islands, from whose seas
> Our nostrils snuff the fragrant breeze.

And then in quick succession comes the attendant train,—a bridal party on their wedding tour, dressed in all colors save that of black alone; for theirs is a life of joy; sorrow is unknown.

But what means this sudden burst of bloom? All nature seems aglow, and earth herself in rapture clasps her hands for joy. Those are the fruit-bearing blossoms. They come not too soon lest frosts should blight their prospects, nor yet too late to ripen up their loads of luscious fruits, to bless mankind with luxury and health.

A wise Creator must have planned it all. And yet through all the summer months our paths are incessantly strewed with flowers; no sooner does one set step aside than another takes its place, not copying the works of its predecessor, but forming, still forming and still executing some new design in an endless multiplicity of characters and colors. And then when frosts appear, and nature's outdoor pets begin to droop and die, the blue-eyed Gentian gives a parting smile, and winter, stern winter comes and forces all within a safe retreat, where ivy-curtained walls and window plants in bright profusion bloom, to cheer our hearts and gladden all within. Our homes are what we make them, make them what we will.

Fame and Work.

Other Horticultural Societies are watching our progress with much interest. Wisconsin places our work side by side with her own, and our Canadian brethren seem to be particularly anxious to know what we are doing; and even in Bremen, that for-off land of flowers, where some stray leaves of our transactions have chanced to fall, we have been quoted and our views commended by some of those old scientific horticulturists as standard authority, emanating, as they evidently suppose, from men of profound learning and experience. Let us not try to undeceive them, but still continue our work with a zeal worthy of the cause in which we are engaged.

Thus you see that our influence is not confined to the limits of our own State, and there is still a vast region beyond, having a soil and climate similar to our own, that cannot go elsewhere for experience and advice with the same assurance of success. I merely speak in view of the important results that must accrue from our well-directed efforts in horticultural science. Go beyond the borders of our own State, across the Red River of the North, through the land of the Dakotas, along the Abissinawa, and all that region beyond which the eye of civilization has never yet explored, and we have a country equal in fertility and more extensive than the valleys of a thousand Niles.

"The march of empire westward wends its way," not tardily, but with locomotive speed, and scarce has the iron track marked out its course before we see vast fields of waving grain spread out like ocean's broad expanse. But this is not civilization, it is only capital that precedes it, and must soon give place to thriving towns, villages and rural homes with all the surroundings that mark the progress of civilization and refinement. How soon do we see the school house prominent in the centre of every district, and in every community the church spire pointing to the invisible.

Ladies and Gentlemen, yours is a great work; you are laying a broad foundation that other societies similar to ours will yet build upon. You are instilling into the popular mind the principles of peace and good will. While the husbandman is beating the sword into the plowshare, it is yours to turn the spear into the pruning hook. And in adorning and beautifying your homes and making them attractive, you but set the example that others will follow until every home shall be made a place of beauty and a paradise to its possessor. Then may we look for the millenium, and not till then. In the meantime we must not expect that sunny skies and flowery paths will lure us on the way, but steady, persevering, well-directed effort, step by step, will bring us nearer, still nearer, to the goal of our desires.

COMMITTEE ON ADDRESS OF PRESIDENT.

Copy of the address was ordered filed for publication, and the appointment of a committee on the same was then taken up.

Mr. Jordon. I move that the chair appoint the committee.

Motion was seconded and carried.

Committee:—R. J. Mendenhall, T. G. Carter, J. S. Harris.

Horticultural Literature.

Mr. Gibbs. I was thinking whether it wouldn't be better to appoint different committees for the different parts of the address. There is enough for one committee on the Dissemination of Horticultural Literature alone. Move that the committee be requested to pay particular attention to this part of the address.

Motion was seconded and carried.

Mr. Harris. Would like to ask where we are to get this literature for distribution. We must have some before we can distribute it. I very seldom see a word in papers from any of our Minnesota horticulturists.

Mr. Gibbs. I intended my motion to have reference to the getting of this literature, and then devising means of dissemination.

The Secretary. Under this title, horticultural literature, I understand our transactions, publications, &c.

Mr. Harris. I understand by horticultural literature all that which is connected with horticulture. I think if we could publish all the wise things said and written in our meetings, and spread it among the people, we would do much good. Our transactions reach but few farmers, and only a few farmers take the time to read the articles in the papers they get, and many don't get any paper at all. But if we could induce some one to collect our wise sayings and doings and publish them, I think we would reach more people. I am not a writer and couldn't do the work, but we have plenty of men that could.

Doministe Apple.

Mr. Jordon. Would like to ask whether any one here has grown the Russian apple called Doministe, or whether any one knows anything about it.

Nobody seemed to know it. The Doministe was on exhibition.

Untried Varieties.

The Secretary. I suggest we hear the report of the Committee on the Purchase of Untried Varieties of Fruits and Plants at Fancy Prices.

Mr. Harris. That report is not ready, but will try to get the committee together, and have the report ready by to-morrow.

University.

The Secretary. I would here extend the invitation of the President of the University to the members of the society to visit our State Institution at their convenience and taste.

Committee on Seedlings.

Mr. Harris. Move that a standing committee on seedlings be appointed, whose duty it shall be to report at our annual meetings. Motion was seconded and carried.

Pres. Grimes. How shall that committee be appointed?

The Secretary. Move that the committee of last year acting in that capacity be appointed. Motion was seconded and carried.

Horticultural Exhibit at State Fair.

The Secretary. I suggest we hear the report on the Horticultural Exhibit at the State Fair held last year, if there are no objections.

Mr. Harris read the report, there being no objections, and the report was filed for publication. It was as follows:

HORTICULTURE AT THE STATE FAIR, SEPT. 1ST TO 8TH, 1879.

The horticulture exhibits at the State Fair held in St. Paul during the first week in September, 1879, were very fine, but in some respects not equal to those of 1878. This was the result of a combination of causes. First, the time of holding the fair is about ten days too early to get the best effect from our apples and grapes. Grapes were pretty generally unripe and most of the apples not sufficiently colored up and matured to show their best points. From some peculiarities of the season apples were not generally as large and fair as the previous year, and many specimens were wormy, showing that the season was favorable for the ravages of the codling moth, and in some of our best and most extensive vineyards grapes were a very bad failure, probably the worst known in this State for many years. Again it was pretty generally understood that the fair was to be an agricultural one and some of our fruit growers became demoralized thinking that agriculture could not stand a ghost of a chance when brought into competition with the famous fast horses that were being arrayed against it in the neighboring city of Minneapolis during the same week, and would not exhibit because their premiums could not be guaranteed, or because such things as fruits and flowers would not be appreciated under such circumstances. However, the exhibit was pronounced to be a good one by all who saw it, and it was a credit to our State, and particularly so to the members of the State Horticultural Society who have for many years been striving to give fruits and flowers a prominent place in our fairs.

Entries of Fruits.

There were 194 entries made against 242 the previous year. The larger part of the falling off was in grapes, there being but 35 entries of them all told.

There were 69 entries made and filled in the floral department; the varieties of plants were usually very choice, and in fine condition.

The display in the vegetable department was equal to any ever made in this State. Refer to U. S. Hollister, Supt.

PREMIUMS ON APPLES.

Premiums were awarded as follows:

Best and Greatest Variety of Apples.

1st Premium,	J. S. Harris & Son, La Crescent	$15	00
2d "	John Hart, Winona	10	00
3d "	J. T. Grimes, Minneapolis	8	00
4th "	Wm. E. Brimhall, St. Paul	6	00

Greatest and Best Variety of Winter Apples.

1st Premium,	J. S. Harris & Son.	$10	00
2d "	John Hart	8	00
3d "	J. T. Grimes	6	00

Best Display of Autumn Apples.

1st Premium,	J. S. Harris & Son	$6	00
2d "	J. T. Grimes	5	00
3d "	W. E. Brimhall	4	00
4th "	John Hart	3	00

SINGLE PLATES OF APPLES.

Wealthy.

1st Premium,	W. E. Brimhall	$2	00
2d "	A. W. Sutton, Excelsior	1	00

Duchess.

1st Premium,	W. E. Brimhall	$2	00
2d "	R. Knaupheide, St. Paul	1	00

Tetofsky.

1st Premium,	W. E. Brimhall.	$2	00
2d "	J. T. Grimes	1	00

Fameuse.

1st Premium,	W. E. Brimhall	$2	00
2d "	J. T. Grimes	1	00

Haas.

1st Premium,	A. W. Latham	$2 00
2 "	J. S. Harris & Son	1 00

Cole's Quince.

1st Premium,	L. R. Hawkins, Iron Lake	$2 00

Siberians and Hybrids—Greatest Variety.

1st Premium,	J. S. Harris & Son	$10 00
2d "	Wm. E. Brimhall	5 00

SINGLE PLATES.

Transcendent.

1st Premium,	W. E. Brimhall	$2 00
2d "	J. T. Grimes	1 00

Hyslop.

1st Premium,	A. D. Roe, Afton	$2 00
2d "	J. T. Grimes	1 00

Virginia Crab.

1st Premium,	W. E. Brimhall	$2 00

SEEDLING APPLES.

Best for all purposes, John Hart, Winona	$5 00
Best Sweet, John Hart	3 00
Best Autumn, John Hart	3 00
Best Winter, Geo. Hartman, Hokah	5 00

Other Exhibitors of Apples.

Other exhibitors who made displays worthy of note were E. Lemke, St. Paul; L. R. Hawkins, Iron Lake, dozen varieties, very choice; Lorenzo Hoyt, St. Paul; R. Knaupheide, H. P. Robie, Rush City; Miss Sarah Ramaley, St. Paul; T. G. Carter, St. Peter; S. Naden, Little Canada; J. W. Boxell, Afton; P. Donnelly, Nininger; D. Demans, White Bear Lake; C. Christopherson, Lake Mountain; Conrad Wiegand, McGregor, Iowa; L. T. Adgetent and Jas. Washburn, also of McGregor.

Grapes.

The exhibits of grapes were made by R. Knaupheide, A. W. Latham, A. D. Roe and J. C. Kramer.

First premium on varieties awarded to R. Knaupheide; second to A. W. Latham; third to A. D. Roe.

Mr. Knaupheide was also awarded nine first premiums on single varieties, and J. C. Kramer premium for best seedling.

Flowers.

In the floral department premiums were awarded as follows, viz:

1st	Premium,	F. C. Fleischer,	display of	greenhouse plants	$20 00
2d	"	"	"	Geraniums	6 00
1st	"	"	"	Climbing and trailing vines	5 00
2d	"	"	"	Double Fuchsia	1 00
2d	"	"	"	Roses in Bloom	6 00
2d	"	"	"	Coleus	6 00
1st	"	"	"	Foliage plants	6 00
2d	"	"	"	Tube Roses	3 00
3d	"	"	"	Geraniums	4 00
2d	"	"	"	Climbing and Trailing Vines	3 00
2d	"	"	"	Fuchsia	6 00
2d	"	W. A. Lemke, St. Paul,	display	Greenhouse Plants	15 00
1st	"	"	"	" Single Fuchsia	2 00
3d	"	"	"	" Roses in bloom	4 00
2d	"	"	"	" Foliage Plants	4 00
1st	"	"	"	" Tube Roses	5 00
2d	"	"	"	" Pansies	3 00
2d	"	"	"	" Hanging Basket	3 00
3d	"	L. M. Ford, Grove Lane,	display	Greenhouse Plants	10 00
1st	"	"	"	" Geraniums	8 00
2d	"	"	"	" Dahlias	3 00
1st	"	"	"	" Single Ger. in bloom	2 00
2d	"	"	"	" Hanging Basket	2 00
1st	"	E. F. Lemke, St. Paul,	"	Fuchsias in bloom	8 00
1st	"	"	"	" Roses in bloom	8 00
1st	"	"	"	" Coleus	8 00
2d	"	"	"	" Foliage Plants	4 00
1st	"	"	"	" Pansies	5 00
2d	"	"	"	" Floral Designs Natural leaves and flowers	3 00
2d	"	Miss Sarah Ramaley, St. Paul,		Single Geranium	1 00
1st	"	By Amateur,		Greenhouse plants	15 00
2d	"	Mrs. W. E. Brimhall, St. Paul,		display Greenhouse plants by Amateur	10 00
Mrs. W. E. Brimhall,		display of		Dahlias	2 00
4th	Premium,	Theatoine Yanze,		green house plants, by Amateurs	3 00
2d	"	J. E. Booth, Minneapolis,		Floral Design, Land Scape	.....
2d	"	A. D. Roe, Afton,	display	of Gladioli	3 00
1st	"	Hollister, Castle & Co.,	display	of Gladioli	5 00
3d	"	Mrs. S. Lasher,		Floral design.	
3d	"	Mrs. L. Kittson,	display	of green house plants by Ama.	4 00
1st	"	Alex. Runze,	display	of Dahlies	5 00
2d	"	Alex. Runze,	display	of Pansies	2 00

EXHIBITION WITH STATE AGRICULTURAL SOCIETY.

Some very fine pears and native plums were on exhibition; also, a few peaches. Several varieties of seedling apples were referred to the winter meeting of the Horticultural Society.

At the close of the Fair the entire collection of J. S. Harris & Son, over forty varieties, was donated to the St. Paul & Sioux City Railroad to be placed on exhibition at the exposition in Chicago, where they received favorable mention. I have grave doubts as to the utility of making exhibits under the auspices of the Agricultural Fairs as now conducted, I think it would be much better to hold a three or four days exposition of our own, and spend a portion of the time in meetings for discussion, at least until there is some reformation in our agricultural societies. Horticulture is civilizing and tends to benefit mankind and enrich our State, and we should never allow it to be placed in the back ground of horse racing and gambling, where our sons are demoralized and fleeced of their dearly earned savings.

Respectfully submitted,

J. S. HARRIS.

DISCUSSION.

Horticultural Exhibitions.

Mr. Harris. It seems to me the time has arrived when we should cut loose from the Agricultural Societies. From the treatment we have received lately it seems almost necessary. If we had an ample building for exhibiting our fruits in, and had a few persons there who could answer the questions of the visitors and give necessary explanations, we could do more good. Seems to me if we would erect a building for exhibiting our best fruits, and limit our premiums to about $1,000, we could get along alone very well. I believe we could lay up money, besides paying our premiums. And we could hold a series of meetings during the exhibition. Am in favor of cutting loose and trying it alone. I would move that a committee be appointed to investigate this matter, confer with the executive committee, and report on the feasibility of cutting loose from the Agricultural Society.

Mr. Gould. I have to object to this. I think it would be a pretty slim thing, if we undertook it ourselves. The object of agricultural fairs is to see what "each other" are doing in raising fruits, flowers, and cattle, &c. And I think the best thing to do is to continue as we have. This society has had one or two meetings on their own hook. I attended one; the other I could not attend, and the crowd was very small. Don't think it would pay to cut loose, and I would not want to enter into it.

Mr. Brimhall. I am in favor of the motion. Think we could

have evening meetings in addition. These meetings would be attended by the mechanics and other day laborers, and I think we have hung out long enough. It is high time that we cut loose.

Mr. Storrs. Am also in favor of the motion. It couldn't be any worse than it is at present. We don't get any premiums anyhow, and, as Mr. Brimhall said, we could hold evening meetings, and do more good.

Mr. Pearce. Think it would be a financial failure surely. Have seen so many societies start out on their own hook, and all failed. Think if we could be incorporated in some fair association so as to have a share in profits, if money is what we are after, it would be better than cutting loose. But dollars and cents is not what we are after, and therefore we don't want to do it.

The Secretary. We must consider the number of people drawn out by agricultural fairs in connection with the dollars and cents question. The society is gathering strength and popularity, but is not yet popular enough to have separate exhibitions. Do not believe we will get the number of people from all parts of the State as we do when we are in with another association. As to the financial success of such an undertaking I am somewhat doubtful. And, as for me, I am willing to let other associations carry the enormous amount of work involved in the preparation for a fair.

Mr. Elliot. Think Mr. Gould struck the key-note in regard to making exhibits. Each exhibitor will go where he expects to see the largest crowd and where the biggest premiums are offered, whether he gets the premiums or not. And whenever the State Agricultural Society has had money we were paid, and when they had no money the premiums were not paid. Think it will always be so. I am in favor this year of "laying" back, and go where we can get the best inducements. Let each one exhibit where he wants to. Don't think it is anybody's business where I or some one else goes to exhibit. Let each one use his own judgment.

The Secretary. Believe we can do something that will help us in the future. The Horticultural Society and Agricultural Society of Michigan and Wisconsin hold some relation to each other. Think it would be good if we would find out this relation, and would move this amendment, that we ascertain what this relation is.

The amendment was seconded and carried.

The motion was then also carried.

ARTICLES ON EXHIBITION.

Mr. Mathews. After looking over the exhibition of fruits, flowers, &c., and seeing so much that ought to be mentioned, I am sorry to say that I cannot make a creditable report on the articles exhibited; and as I am obliged to leave, I would respectfully ask that some one be appointed to fill my place. We have here an exhibition of fruits that ought to be known to the people.

It was moved and seconded that Mr. Mathews be relieved of his duty. Motion was carried, and Mr. Cook, of Rochester, was appointed in Mr. Mathew's place.

President Grimes. Wouldn't it be well to consider the invitation of the President of the University?

The Secretary. Seems to me it would be better to make individual visits, not a visit as a body.

The President agreed, and Mr. Probstfield's motion to adjourn till half past eight to-morrow was seconded and carried.

THURSDAY MORNING.

The Society was called to order by Pres. Grimes at 9 o'clock. The first business attended to was the reading by the Secretary of communications from Hon. M. P. Wilder, President American Pomological Society; Chas. W. Garfield, Esq., Secretary Michigan Pomological Society; Hon. P. Barry, President W. N. Y. Horticultural Society, and Dr. P. L. Hatch, of Minneapolis. The communications were as follows:

LETTER OF HON. M. P. WILDER.

BOSTON, Dec. 29, 1879.

MY DEAR SIR: I have looked over the Transactions of the Minnesota State Horticultural Society with interest, as well as with profit. I do not see how I could advise you to adopt a better system than you have already established. Your plan of receiving reports from the various counties, and from practical men, is eminently beneficial. This is the way to procure varieties best suited to different sections of the State. I am much pleased with the papers on particular subjects. Several of them are worthy of a wide circulation. Exhibitions and discussions are the great elements of progress and enterprise. These have been very influential with the Massachusetts

Horticultural Society, and enable us to keep abreast with the improvements of the age. I send you herewith my address before that Society on its 50th Anniversary, by which you will see how, from small beginnings, it has become a powerful Association in promoting American Horticulture. I add also my address read at Rochester, at the late session of the American Pomological Society, and will send the "Proceedings" as soon as published. I regretted exceedingly my inability to be there in person, but the accident which befel me last spring prevented me from leaving home. Hoping that I may be quite well by the next meeting, and receive a large delegation from your State, and among them Wyman Elliot, who I well remember, I am, as ever, Yours,

MARSHALL P. WILDER.

CHARLES Y. LACY, Esq., Sec'y, &c.

LETTER OF CHAS. W. GARFIELD.

SECRETARY'S OFFICE,
GRAND RAPIDS, MICH., Jan. 12, 1879.

Prof. Chas. Y. Lacy, Sec., &c.:

MY KIND SIR: Our society is under many obligations to you for the liberal box of exchanges which you have sent us, and I trust in some way we can in a practical manner appreciate the favor. If there is anything I can do in the way of reports for your society, or you personally, please to call on me with no hesitancy. The different parts of my work follow each other so closely that the years are busy ones with me. We hold quarterly meetings, which are intended to be quite extensive pomological institutes. The annual meeting I began to prepare for about October 1st. It is held the first days of December. As soon as this is out of the way the winter meeting in February must receive attention. The June meeting we make a great deal of, and when this is over the September session must at once receive a bountiful supply of work, for it is in connection with the State Fair, and we make a large exhibit of fruits and flowers. This meeting must be a grand success, for here we make our money to do all of our work. The free distribution of our volumes gives us little opportunity to get members. I have to put a great amount of time on one volume. Our people are so much pleased with the Secretary's portfolio that it can not be given up, and no one without experience can guess how much time it takes. Our reports are not what they would be had we more money to work with. The Kansas Agricultural Reports seem to me in the best shape to do good for the State of any I got. I am satisfied it pays a State to issue as valuable reports as possible and circulate them freely abroad. Michigan's standing in pomology is due to the reports of our society and the missionary spirit of the association. In answer to the circular letter I sent out to State societies, I am surprised to find the State government allows them so little aid. To Kansas belongs the banner in this regard. Pardon me for writing with so much verbosity concerning our work. I do it because I enjoy receiving such letters from other secretaries. My volume is now all in hands of printer and 200 pages in print. Will send you copies as soon as out; more than ten if you desire.

Yours truly,

CHAS. W. GARFIELD,
Grand Rapids.

LETTER OF HON. P. BARRY.

ROCHESTER, N. Y., Jan. 9, 1880.

Chas. Y. Lacy, Esq., Minneapolis, Minn —

MY DEAR SIR: Your esteemed favor of 24th ult. came duly to hand, also the volumes of Transactions, for which I am greatly obliged. Your society is doing a good work for your State in collecting and publishing the results of so much experimental fruit culture and general horticulture.

How valuable these books to new settlers in your State and others possessing similar soil and climate.

I see you have agreed upon two apples for general cultivation—*Duchess* and *Wealthy*. Even this is valuable progress.

He who produces an abundance of these will not be very badly off for apples; and you will soon add others.

The Russians, though not meeting our expectations, cannot fail to contribute to your list of *hardy* sorts.

I observe that but little has been done with pears. I would take the liberty of suggesting that pear seedlings be planted for experiment—say by the 100 or 1,000—in nursery rows, two or three feet apart in the row, and let them grow several years without being budded or grafted. The hardy ones will survive; those not hardy will die. In this way hardy stocks may be got for your Flemish Beauties, Onondagas, and other hardy sorts.

This might fail, but the experiment would not cost much. It is easy to protect the roots by mulching, but you want a *hardy trunk*.

I do not know but that every reasonable effort has already been made to grow pears; still I think if I were living there I would have pears. Many of our fine plums are very hardy, enduring perfectly the climate of Maine and lower Canada, where the mercury falls as low as with you. It will not be many years until we shall hear of your culture of the peach, pear, and other fruit too delicate for the open air, in cheap glass structures. Even here, where we have a tolerable peach country, we fruit all our peach and Nectarines in tubs under glass.

On the 28 inst. our society will hold its 25th annual meeting.

We flatter ourselves we have done some good to our country, and our meetings have been pleasant annual reunions—a sort of holiday that we all enjoy. We have now a large force of working members and are better equipped than ever before. I will send you Transactions.

With best wishes for yourself and your excellent society, I remain,

Truly yours,

P. BARRY.

LETTER FROM DR. HATCH.

MINNEAPOLIS, MINN., Jan. 15, 1880.

Prof. Lacy—

DEAR SIR: Your note and slip contained were received to-day. In reply I will say that I am glad to say a word in the defence of the "Sapsuckers." It is a libelous name, and if it were not for its having been embalmed by that venerable ancestor, Aunt Iquity, I would be in favor of petitioning the

legislature to change it to Tree Benefactors. Mr. Clay is right. If any additional argument in their defence is needed, let me ask objectors to examine the bills and tongues of the two species of woodpecker which are indiscriminately called by the misnomer, sapsuckers, and see if it is possible for them to suck up with one or sop up with the other the sap, as charged. Their bills are not air tight, the mandibles not being so closely opposed as to make them a perfect tube, and a considerable portion of their tongues is hard and hornlike, while the extremity is very acute and attenuated, forbidding their adaptation to sopping up a fluid. As numerous dissections, while revealing their insectivorous habits, have failed to find the "liber" or inner bark of any species of tree, they must be exhonorated from this charge also. But still further, in their defence, let me say that the time for them to get sap and inner bark is spring, when both abound, and when we certainly should expect a good appetite for them in the diminished supply of insectivorous force; but the boring is done in autumn. And let us now and forever do the sapsuckers justice by exhonorating them from the *fowl* aspersion. Very truly yours,

P. L. HATCH.

P. S.—I am greatly obliged for the Report, for which accept acknowledgments. P. L. H.

THE BORER AND SAPSUCKER.

The paragraph referred to by Dr. Hatch was as follows:

I desire to call the attention of your readers to the grave errors which exist about the sapsuckers and apple-tree borers. Sapsuckers are insectivorous, and live mostly upon the larvæ of insects, burrowing in rotten wood of trees and stumps. They also search the bark of trees, and are fond of the apple-tree borer—thrusting their long, hard bills into the borer-holes, and eating the grubs. Sapsuckers have greatly decreased within my memory, and borers and other vermin have greatly increased. So that whole orchards are destroyed, and sound fruit is exceedingly rare. The error is in killing the birds and fostering the vermin. No idea is more common in our State than that the sapsucker perforates the bark of trees, and sucks the sap, and eats the soft under-bark. This is a total error. My apple orchard has been almost entirely destroyed in the last 20 years by the borer, and a half dozen sapsuckers are hardly seen in a season.

The borer, a species of beetle, winters in the rough bark of trees, lays its eggs in regular rows around the apple-tree, and these, when they are hatched, penetrate the soft bark, and then are transformed again into the beetle. The trees about my doors have, this year, been bored, and not a single sapsucker, the red-breasted or any other species, has been seen, but on my box. No large animal feeds in mathematical lines; but many insects, as the bee, borer, locust, etc., do use these lines in depositing their eggs. So that we have experience and analogy in favor of the beetle theory, and all against the instinct and habits of the sapsuckers. The same class of observers accuse the crow, (because they are found among the sheep feeding upon the placentas, or after-births, of the ewes) of killing lambs. Now, last

winter, the crows were every day among my ewes, and not a lamb was killed.

CASSIUS M. CLAY, Whitehall, Ky.

DISCUSSION.

Borer and Sapsucker.

Mr. Harris. There is a bird called the sapsucker that does not eat insects. It is of the color of the hairy woodpecker, with red on its breast.

Mr. Storrs. There are two species that look much alike. One is smaller than the other. Have killed both and examined their crops. Found inner bark, but no insects in one. In the other I found insects or grubs.

Mr. Hollister. We find the sapsucker on evergreens, and there are no borers there.

Mr. Dart. There is a disposition on the part of their lovers to acquit all birds of crimes, which facts do not bear us out in doing. We know the injuries of the sapsucker, and we should not allow this letter to contradict that knowledge.

Mr. Storrs. I protect birds in general, but condemn the sapsucker.

Mr. Sias. I had an evergreen in my yard bored by the sapsucker, which I wrapped with cloth and then saturated this with kerosene, and thereby saved the tree.

MINNESOTA MAMMOTH GRAPE.

The following letter, from Mr. Buck, of Mankato, was read by the secretary:

MANKATO, MINN., January 20, 1880.

Secretary State Horticultural Society—

DEAR SIR: Enclosed find advertisement which is being published in our papers. Can you or your society tell us anything about this grape? Is this grape what it is represented to be? It seems strange that if it has the merits claimed for it that it has not been exhibited at the Fairs either at Minneapolis or St. Paul. I feel greatly interested in grape growing in this State, but there are so many who impose upon the people for high-priced and spurious vines and trees, that I feel like doing what I can to find out the truth. Many are purchasing this vine, but I have grave doubts about its being what it is represented to be. Please let the people know about it.

Very respectfully,

DANIEL BUCK.

The following is a copy of the advertisement referred to:

MINNESOTA MAMMOTH!

A Seedling Grape the color of the Delaware.

LARGEST, HARDIEST, EARLIEST OF ANY GRAPE PRODUCED IN MINNESOTA.

It has stood the test for fifteen Minnesota winters, bearing fruit without any protection, or being taken from the trellis. It is double the size of any other grape grown in Minnesota; two weeks earlier than the Concord. Has a fine spicy flavor peculiar to itself, and as hardy as any wild vine of Minnesota. These vines were raised at Excelsior, where the parent vine can be seen, and two year old vines bought at one dollar each.

One of these vines has now over 200 clusters of grapes on it, which are now ripe; and the vine has grown over twenty-five feet this season; this vine was trimmed close last fall, furnishing over 200 cuttings.

N. B.—The above vines will be sent by mail, securely packed and post-paid, on receipt of the price, $1 each, $5 per half dozen, and cuttings at 10 cents each.

DISCUSSION.

Minnesota Mammoth Grape.

Mr. Dart. I should pass small axes, but this appears to be almost worthy of our attention.

Mr. Storrs. I visited this vine last fall when in fruit. The grapes are as represented, but as to flavor I would say but little. With regard to the matter of size, Mr. Gideon said, "so is the pumpkin large." Have had it in bearing four years, but I make but little use of the fruit. Paid $3 for mine, but am not sorry.

Mr. Probstfield. The same is largely circulated in our part of the State.

Pres. Grimes. This grape came before our society some years ago and was dropped because of its quality, but it suits some tastes. It has a sweet pulp with a thick skin. In rich soil it is a poor bearer.

Col. Stevens. In 1849 Mr. Pettijohn brought several Northern Muscadine vines from Illinois. These were planted near Fort Snelling, on land which later became Moffat's Nursery. No doubt this is a seedling of the Northern Muscadine, since several years later this was found in the same place.

Mr. Carter. Think this is the light-colored wild grape of New England. Mr. Stratton represents its quality as very fine, the color of the Delaware, and that it is a seedling raised by a neighbor whose name I cannot remember. It is not Moffat's Seedling, for the fruit hangs on till it gets ripe.

Mr. Clarke. A few years ago I indulged in a few vines of this variety, and I should say that the fruit is companion to the potatoe ball more nearly than to the Delaware. I do not want to waste too much time but think we should take some action on this matter.

Mr. Harris. I move that it be the sense of this Society that this grape is unworthy of either cultivation or trial as a fruit. The motion was carried—18 for and none against.

COL. STEVENS' PAPER.

Col. Stevens read his paper on the Catalpa in Minnesota, which was ordered on file for publication, and reads as follows:

The Catalpa Tree in Minnesota.

While exploring the wilds of the country around Lake Minnetonka, in the winter of 1852, in company with John G. Lennon, Esq., of this city, and the late Capt. Arther Mills, we encamped for the night on a point of land nearly opposite the present residence of Peter M. Gideon. Our camp was made in a grove of tall timber, the variety of which was unknown to us. It was different from any that we had ever seen. There were some sixty or seventy trees—thrifty; large at the buts, and of fine form and beautiful appearance.

Subsequently a mill was erected on the creek below the lake. The timber which supplied the mill was cut on the shores of the lake, and floated down to the mill. The mill proprietors, Messrs. Calvin A. Tuttle & Co., were informed in relation to this grove or clump of trees, which appeared to me to be susceptible of making good lumber. Messrs. Tuttle and Simon Stevens, two of the owners of the mill, visited the strange grove of timber; found that it was convenient to the shore; that it was capable of being manufactured into lumber, and placed some of their workmen to making it into saw logs. Neither Mr. Tuttle or Mr. Stevens, or for that matter no one else knew the name of the timber; neither could they class it with any variety they had ever seen. The logs in good time were landed at the mill, and manufactured into lumber. At, or about that time, B. E. Messer, who at a later period was elected high sheriff of this county, and who was a member of the Constitutional Convention that created the fundamental law of this State, and who is now a clerk in the Treasury Department at Washington, established a cabinet shop in Minneapolis, and most of this peculiar lumber manufactured from the strange timber found on the shores of Minnetonka, fell into his hands, and was made up into household furniture, and fortunately one of these articles fell into my hands and remains in my house to this day.

At a meeting of the Board of Regents of the University of Minnesota, held in St. Anthony in the fall of 1853, I presented to the members of the Board specimens of this wood. None of the then members could identfy it, but the late Maj. A. Van Vhooes, one of the Regents who had lived in Ohio, remarked that it resembled in every particular a species of timber which was incident to that State, and was known as the Catalpa, but as that tim-

ber was known only to grow in a semi-mild climate, he did not suppose it could be found so far north, though he thought it must belong to that species of timber. After making other unsuccessful efforts in classing it, the matter was forgotten until the spring of 1873, when I was in the capitol grounds at Indianapolis, Indiana, I discovered trees of a kindred character and appearance to the long forgotton unknown timber on Lake Minnetonka. I eagerly asked the name of the trees and were informed that they were the Catalpa, which, to my own satisfaction, solved the Minnetonka problem. Upon my returning home to this city, I immediately ordered a few Catalpas from J. S. Shearman, of the North-Western Nursery, at Rockford, Ill. I only retained one, which is alive and in my grounds at this time, and though it has never had half a show for its life, I do not think a bud has ever been destroyed. Each year it sends out its bloom. My immediate neighbor, Mark T. Berry, Esq., has one from the same lot, which, in like manner, has also for the past three or four years sent out its annual blossoms. There are other Catalpas in the gardens of some of our citizens, but in some instances they have not proved as hardy as could be wished, but evidently they belong to a more tender variety.

During the past year I had sent me by a gentleman from Ohio samples of the two varieties of Catalpas, to which I called the attention of Mr. Tuttle, one of the parties who cut and manufactured the timber from Minnetonka. He immediately recognized it as identical with the strange wood which we had not been able to classify for so many long years. How, or in what way this little grove of Catalpas originated on the shores of the lake, solitary and alone, we have never been able to determine.

The hardier variety of the Catalpa, as well as that of the more tender, is a timber of great merit. Quick in growth, of lasting durability, beautiful as shade and ornamental trees, it is admitted by the most skeptical that it is hardy as far north as latitude 42°. I do not recommend it as hardy in this climate, though it may be. I only speak of my own experience, and with my humble experience in the propagation of trees in this section of the Northwest. I should not hesitate to plant this variety of timber could I personally superintend the necessary cultivation in order that they might reach maturity.

DISCUSSION.

Catalpa.

Mr. Sias. Have seen fine trees growing well in Olmsted County. They are hardy on high ground and northern exposure. They bloom finely.

Mr. Carter. I have had it several years, and it kills down yearly. It grows rapidly during the summer.

Mountain Ash from Seed.

Mr. Brimhall. Would like to hear how to grow Mountain Ash from the seed.

It was moved to take this subject up for discussion, which motion was carried.

A member stated that the seed would sometimes lie in the ground until the second season.

Mr. Brimhall. They would not grow for me even the second year.

Mr. Grimes. Years ago I planted some seed in the fall, which came up in the spring. I transplanted them, and they did well throughout. None of the seed came up the second year.

Mr. Hollister. I have treated them the same as I do Red Cedar, which I treat as follows: As soon as ripe I bury two or three feet deep,—pulp and all,—confined in earthen crocks. Here it remains through two winters and one summer. Then I plant. Must screen the young plants from the sun. Always use for such seeds soil as light as is consistent with fertility. I put no dirt in the crock with the seeds.

REPORT OF THE SECRETARY.

The discussion was closed by vote of the Society, and the report of the Secretary was read, and accepted. The following is the report:

Mr. President and Gentlemen:

On laying down the office of secretary, which I propose to do positively at this meeting, it might be expected that my final report should contain something besides the usual record of business and of progress—some soaring expressions relating to the noble and elevating art of horticulture—the future of horticulture in this State, and the future of this society. The opportunity, I must acknowledge, is a good one, but I think I may fairly claim that my connection with this society has been in the role of a laborer rather than in that of a talker, and I do not feel now like changing titles.

So far as the business of the secretary's office is concerned, I may be brief.

Executive Committee.

No meetings of the Executive Committee have been held during the past year, but the members have been consulted by letter on matters requiring the action of the Committee, such as the preparation of the programme for this meeting.

Library.

Owing to laxity of the secretary in the matter of making exchanges, the additions to the Library have not been numerons. They are as follows: Transactions Wisconsin State Horticultural Society, Vol. VIII., 1878, one volume in cloth. Transactions Wisconsin State Horticultural Society, Vol.

IX., 1878-9, one volume in cloth. Report of Michigan Pomological Society, 1878, one volume in cloth. Transactions Iowa Horticultural Society, 1878, one volume in cloth.

Premium Lists.

The list of premiums recommended by this society to be offered for fruits and flowers at the State Fair was duly forwarded to the secretary of the Agricultural Society. How far this list was adopted I have not observed, but as the list was printed in our last Transactions it is in convenient shape either for comparison or revision. The rules adopted for the judging of fruits were not, however, sent with the list of premiums and the Transactions were printed too late to allow of the rules being followed in making awards the past year.

Agricultural College.

In years gone by it was not rare for this society to appoint a committee on Agricultural College: and in the first years of my connection with the society, I made some effort to get committees appointed that would work. According to newspaper reports there seems to be work for such a committee now, or for some one else. According to the same authority two things were made evident at the recent meeting of the Board of Regents. 1st. Their impatience at the practical indifference of the people to the facilities supplied for instructions in the sciences related to agriculture; and (2d) skepticism regarding the amount of labor involved in maintaing an experimental farm, and the value of the results of such labor.

Minnetonka Fruit Farm

The report of the superintendent of the Minnetonka Fruit Farm was submitted at the same meeting. I presume a copy might have been obtained, but the report is understood to be brief, and probably does not contain much of deep interest to the society. In passing I would say that I visited said Farm once last season, and succeeded in finding one of the orchards, and am glad to be able to say that I was pleased with its appearance far beyond expectation. The society will doubtless be more interested in the fact that the superintendent has proposed to the Regents the planting of some 400 Russian varieties of fruit to be obtained from the Iowa Agricultural College.

State Commissioner of Agriculture.

At a recent meeting of the State Forestry Association, it was proposed that forestry should be elevated into a department of the state government, to be presided over by a Commissioner of Forestry, whose duty it should be to prepare pamphlets for free distribution, to collect and disseminate information, answer letters, and do what is possible to promote the interest of forest tree planting. The matter is not mentioned here either to commend or discourage, but to suggest that possibly some plan might be devised whereby the interests now committed to the various state societies and associations—agricultural, horticultural, forestry, dairy, poultry, cane,

etc.—should be harmoniously gathered under the general care of a State Commissioner of Agriculture. Of course no plan would be free from serious objections, but we think it entirely possible that some plan could be devised that would be more satisfactory than the present entire absence of plan.

Review.

Under this head the secretary begs leave to call attention of the members of the society to some of the subjects that have attracted his interest during the year, believing that they possess some interest and value for others besides himself.

Wisconsin.

Wisconsin being a near neighbor of ours, and its horticultural condition being more nearly related to our own than that of any other State in which the art has made material progress, the Transactions of its Horticultural Society should perhaps be the more interesting to us. Comparing these Transactions with our own, one cannot but notice a large proportion of papers that are not severely practical in their nature. In the Transactions for 1877 the leading paper is "Northwestern Horticulture in the Future," a subject which permits of a considerable flight of the imagination. Another paper, by J. S. Stickney, is "What I would Like to Do," in which the ideal sought after is very strongly contrasted with the average attainment in horticulture. "Horticulture in Literature" and "Remarkable Trees and Plants" are the titles of other papers, presented by ladies. These papers are rendered none the less interesting by their titles or their authorship, but it needs no quotations to show that they can be of little practical assistance in the production of fruits and flowers in this northwestern climate. "Second Harvests," by another lady, is another illustration of the same character. I do not mention this character of the Transactions in any spirit of criticism. On the contrary, I am glad to see it as an indication of such progress in horticulture that its laborers may turn occasionally from the more laborious and practical to the more intellectual and pleasing features of the art.

A second feature noticed in the volume referred to is the large number of papers contributed by ladies. Besides those above mentioned are others, entitled "Summer Treatment of Winter Blooming Plants," "Inexpensive Methods of Making Home Pleasant," "Our Native Vines," "Garden Vases and Hanging Baskets," and "Flowers as a Home Decoration," making no less than eight papers contributed by ladies to one meeting of the Wisconsin Horticultural Society.

In the Transactions for the Wisconsin Society for 1878-9, we notice first the act of reorganization of the society, in which the following features seem worthy of your attention. 1. The Executive Committee consists of "president, secretary and treasurer of the society, and of one member from each congressional district of the State; said members from the congressional districts to be chosen annually by the county and local Horticultural Societies in the respective districts." 2. The society makes "an annual report to the Governor of the State of the transactions of the society."

This secures the printing of the report like any other State document, and not by special appropriation as in our case. 3. Besides this, the sum of $600 is appropriated from the State treasury to aid the society in carrying out the provisions of the act.

This volume presents the same noticeable features mentioned in the last. The following are some of the subjects in which we might take particular interest: "Production of New Varieties of Fruit," by J. S. Stickney, in which the principal method suggested seems to be cross-fertilizing the flowers of different varieties and growing seedlings from the cross. "Conserving Our Fruits," by Mr. Plumb, is another paper of interest to others than Wisconsin Horticultural Society. A paper on "Humbugs," by Geo. J. Kellogg, is very easy, good-natured and interesting reading. Attention seems to be chiefly turned to humbugs engaged in growing and selling trees.

"Blight" is the subject of another paper, but it seems to present a resume of what has been thought about the disease rather than new facts or ideas. Mr. Peter M. Gideon contibuted to the meeting of February, 1879, a report on "Propagation of New and Hardy Varieties of Apples," covering nearly three printed pages, and setting forth fully the p an and theory of the Minnetonka Fruit Farm. At this same meeting we notice a demand for instruction made in the following form:

Resolved, That this convention requests the Board of Regents of the University to procure suitable persons to hold conventions in different parts of the State, for the purpose of disseminating information of value to those engaged in the different branches of agriculture and horticulture and other useful industries"

Werden Reynolds tells "How to Maintain Interest in Local Societies," giving the history of the Brown County Horticultural Society as an illustration, and the motto, "Duly Intermingle Work and Play," as the key note of its present success. After describing an epoch of usefulness and success, a succeeding one of decline and another of suspension, Mr. Reynold's presented a method: (p. 261.)

Transactions Iowa State Horticultural Society.

Perhaps the discrimination that places Iowa Horticulture second in interest to us to that of Wisconsin is not quite just. However the point is not a vitally important one. The Iowa Horticultural Society, we notice, also makes its report directly to the Governor of the State, and we have seen elsewhere that the Society received an annual appropriation, besides the printing of this report, of $1,000. The Transactions of this Society consist very largely of reports from the fruit districts, the State being divided into twelve of these, and the reports of Standing Committees, of which there are a large number—no less than 37 the past year. In floriculture alone there were four committees having charge of, and being expected to report upon the following subjects respectively: "Greenhouse Management," "Bedding Plants and Annuals," "House Plants," "Our Native Flowers."

Among papers partaking somewhat of a scientific character we notice in Transactions for 1877, "The Climatic Adaptation of Plants," by Prof. C. E. Bessey, of the Agricultural College, and another from Prof. Budd, entitled "Our Excessive Heats of Air and Soil a Main Source of Trouble in Our

Prairie Orchards." Time has not permitted me to ascertain even the points of these interesting papers.

In recent years the Iowa Horticultural Society appears to have been taking great interest in the importation and trials of Russian varieties of apples. pears, plums and cherries. It would appear that the Agricultural College furnishes the facilities for propagation and experiment, and that the Horticultural Society bears the expense of importation—$100 being appropriated for that purpose by the Horticultural Society in 1878, and in 1879 the Society advises additional appropriations for the same purpose. The Secretary of the Society has given much attention to the subject and a great deal of information relating to it may be gleaned from the Transactions for 1878, pages 25, 75 and 260. In the same volume we find a report from Mr. Gideon covering more than three pages, (p. 231,) and Swindling Tree Dealers get the compliments of the Society (p. 235,) in the form of a serious of resolutions addressed to the people of Iowa. Several other interesting topics are treated as the "Construction of Fruit Houses," "Botany in its Relations to Horticulture," "Utilizing Fruits," &c.

Iowa does not support a distinct Forestry Association, but that subject receives a large share of attention from the Horticultural Society which publishes a pamphlet of 24 to 32 pages entitled the Forestry Annual. for free distribution to all applicants. The Secretary reports progress and interest in the work of tree planting and a large demand for the Annual.

Report of Michigan Pomological Society.

As we go farther from home the transactions of the horticu tural societies possess less interest for those of us who seek the practical side of everything, but to those willing to turn to the application of the sciences to horticulture, the Transactions of the Michigan Pomological Society are very deeply interesting. In the Report for 1877, we notice an illustrated paper on "The American Grape Mildew," (p. 134) that possesses more than local interest. The same is true of "The Chemistry of Fruit Ripening,' (p. 149.) One whole article, covering eight large printed pages, is devoted to the subject of "Transplanting for the Farm, the Orchard and the Garden." A discussion of three pages is devoted to the "Wiles of the Fruit Tree Agent," (p. 231.) "Farm Adornment" is a subject more comprehensive in its scope than most papers presented on the subject of adornment, and implies, at least, that something more than the house, the yard, and the garden, are capable of improvement in appearance. "Cross-breeding Fruits" is the title of another paper, which shows that there is some attention paid to improving fruits, even where the necessity is less than with us. A pleasant feature of the Michigan Transactions, is the Secretary's Portfolio, in which are gathered and printed in form for permanent preservation, the short articles on the different branches of Horticulture that came under the eye of the Secretary during the year. It may indeed be called the Secretary's scrap-book which is thus printed and distributed for the benefit of others.

Transactions of Massachusetts Horticultural Society.

Our attention is chiefly attracted here to a paper entitled "Influence of the Stock upon the Graft," in which the writer takes the ground that graft-

ing does not give us, perfectly unchanged, the variety selected, and supports it by numerous examples. In other words the stock influences the fruit of the cion, and according to the writer it does it by influencing the character of the wood on which the fruit grows. Where the stock is small, and all the leaf-bearing parts are removed in grafting, it seems as if the stock could have little to do with the wood of the cion; but where only one limb of a larger tree is removed for the insertion of the cion, considerable influence of the stock upon the wood of the cion would seem to be possible.

American Entomologist.

The Secretary would call the attention of members of the Society to the fact that the American Entomologist has been started again under the editorship of Chas. V. Riley and A. S. Fuller, and published by —— —— of —— New York City. It is presented in a neat dress, and the subscription price is 2.00 per year, the publication being monthly.

TREASURER'S REPORT.

The report of the Treasurer was read, and referred to the Finance Committee.

J. M. Underwood in Account with Minnesota State Horticultural Society:

1879.	Dr.	Cr.
Jan. 24, By cash per Lacy		$64 23
Feb. 7, " cash from A. W. Sias		46 30
		$110 53
Jan. 24, To Prof. Lacy's bill	$50 36	50 36
Balance on hand		$60 17

J. M. UNDERWOOD, *Treas.*

PLANTING RUSSIAN APPLES ON FRUIT FARM.

The election of officers was the next order of business, preliminary to which the payment of membership fees was suggested.

While this business was proceeding Mr. Harris offered a resolution relating to the planting of Russian apples, which was carried, after amendment, as follows:

Resolved, That we recommend the planting of a trial orchard of Russian varieties of apples upon the State Experimental Farm, under proper restrictions regarding the distribution of its products.

Before passing, however, the resolution was subjected to the following discussion:

Mr. Probstfield. How are the cions to be disposed of from this farm?

The Secretary answered that no method had as yet been decided upon or restrictions in their disposition imposed.

Mr. Dart. I object to the restrictive clause, because there is no danger of its being needed.

Mr. Sias. I am opposed to it because it casts a slur on the nurserymen of the State. I don't want any cions myself.

It was moved to reconsider the resolution, and the motion was carried.

Mr. Harris moved to amend by inserting "under proper restrictions."

Col. Stevens. The fruit farm is under the care of the University, and any such restrictions is unnecessary.

Mr. Dart. I believe it is within the province of this society to recommend, and this work is proper to be done by a person in the pay of the State. I believe that, however, is not the best way to promote the horticultural interests of the State. It would be better to offer the same money in premiums for seedling apples.

Mr. Pearce. I was opposed to the fruit farm from the beginning and am now. All nurserymen are now experimenting, and doing as well in that line as Mr. Gideon. It is our business to look up and test the best fruits wherever they can be found. The fruit farm is a humbug.

ELECTION OF OFFICERS.

The election of officers was then proceeded with.

President.

Mr. Brimhall moved that the Secretary be directed to cast the vote of the society for President, but objection being made, Messrs. Pearce and Hollister were appointed tellers, and a ballot taken with the following result: Whole number of votes cast, 22. Mr. Grimes, 21; Mr. Dart, 1. Mr. Grimes was declared elected.

Vice-Presidents.

A ballot being taken for Vice-President for the First District, the whole number of votes cast was 18, of which Mr. Dart received 8, Mr. Pearce 3, Mr. Sias 3, Mr. Cook 3, and Mr. Harris 3.

The Secretary was thereupon directed to cast the vote of the society for Mr. Dart, who was accordingly declared elected.

In the same manner the vote of the society was cast for D. Day and U. S. Hollister for Vice-Presidents from the Second and Third

Districts, respectively, and these gentlemen were declared duly elected.

Secretary.

It was moved that the President be directed to cast the vote of the society for C. Y. Lacy, but the gentleman peremptorily declining, motion was made that the Secretary be directed to cast the vote of the society for U. S. Hollister. The motion was carried, and Mr. Hollister declared elected.

Motion was made to direct the Secretary to cast the ballot of the society for W. E. Brimhall for Vice-President from the Third District. The motion was carried, and Mr. Brimhall declared elected.

Treasurer.

The Secretary was directed to cast the ballot of the society for A. W. Sias for Treasurer, and Mr. Sias was declared elected.

Executive Committee.

Motion was made to direct the Secretary to cast the ballot of the society for the members of the Executive Committee as they stood the previous year.

Mr. Dart. We want a committee that will do the fair thing on premiums.

It was moved as an amendment to substitute Mr. Smith for Mr. Harris.

Mr. Dart called for the election of members of Executive Committee by ballot, which was agreed to, with the following result: Whole number of votes 15, of which Mr. Smith received 9, Mr. Dart 1, Mr. Gould 3, and Mr. Underwood 2. Mr. Smith was declared elected.

On ballot being taken for the second member of the committee the whole number of votes cast was 15, but there was no election.

The Secretary was then directed to cast the vote of the society for Wyman Elliot, and Mr. Elliot was declared elected. In the same manner the vote was successively cast for F. G. Gould, J. M. Underwood, and D. W. Humphrey, who were accordingly declared elected.

Fruit Committee.

Mr. Dart moved that a full fruit committee be appointed, so as to secure reports from all parts of the State, but the President announcing his intention to appoint that committee later, the motion was withdrawn.

Motion was offered to make the fruit lists the special order for the afternoon; but this was also withdrawn.

Delegates to the Agricultural Society.

The following were successively elected, the Secretary casting the vote of the Society: R. W. Twitchell, U. S. Hollister, W. E. Brimhall, D. Day, and H. D. Eldridge.

Motion was made to authorize members present to cast the vote for the full delegation, which motion was carried.

Motion was made to adjourn to 1.30 P. M., which motion was carried.

THURSDAY AFTERNOON.

The Society was called to order by the president, Grimes, at 2 o'clock:

Mr. Fuller proposed to report final resolutions, but it was voted to proceed with the regular order of business, which was

MR. MENDENHALL'S PAPER.

Mr Mendenhall was called upon and read his paper, which was as follows:

PLANT-LICE.

In former papers read before this Society I have given accounts of most of the big bugs that plague the farmer and gardener, and to-day I propose to call your attention to some of their smaller, but by no means less important relations. Among these minute pests are the well known plant-lice, bark-lice, thrips, and tingis. All of these insects belong in the order of true bugs (*Hemiptera*), and subsist exclusively on the sap of plants, which they obtain by puncturing the leaves, buds, and twigs with their tubular, needle-like beaks. When they have exhausted the sap and destroyed the vitality in one leaf or other part of the plant, they withdraw their beaks and seek fresh pasturage; proceeding in this way until a large part of the infested plant is blighted and either killed outright or very much retarded in its growth.

As it would be impossible to treat of all these insects in a single paper, we will confine our attention, for the present, to a few of the most destructive species of plant-lice (*Aphididæ*).

The latter are found wherever vegetation flourishes, and do great harm in a climate like ours, where the annual growing season is short and the plant, whether tree, shrub, vine, or herb, requires the healthy action of all its organs to perfect its flowers and fruit.

There are a great many species of plant-lice, distinguished mainly by the plants upon which they feed, or by the effects they produce by their punctures. They all have jug-shaped or egg-shaped bodies, jointed beaks, two-jointed feet, and, in certain stages of their existence, two pairs of glassy wings, with few straight veins, the upper pair having a dark or opaque pane on the front edge. They multiply, both by eggs and viviparously, by a very singular sort of animal budding process. The majority of the species are provided with two little hollow projections, situated on the hinder part of the back, which are called "honey-tubes," through which the superfluous juices of the plant, with which the insects gorge themselves, are discharged. This sweet and sticky fluid is sometimes so abundant as to smear and drop from the leaves of Aphis-infested plants, and forms the "honey-dew" most commonly observed. It is for the sake of this "honey" that the ants are always attendant on plant-lice, and notwithstanding their usual carnivorous propensities, never kill them, but, on the contrary, will often fight violently to protect them.

The different species of plant lice vary much in color and size, some have the body smooth and glossy, others are covered with a powdery "bloom," others still are clothed in a cottony matter that quite conceals their color and in some instances their form. Some species live openly on leaves, stems and buds, others inhabit galls, or wart-like excresences caused by their punctures, others still are subterranean and feed upon roots. A few kinds, like the notorious Grape Phylloxera, and the Woolly Apple-louse, exist in one stage above ground on the leaves, and in another underground on the tenderest roots.

Mode of Development.

The mode of development in the plant-lice is pretty much the same in all the species. The winter is passed in the egg state. From these eggs, in the spring, hatch wingless, *organic* females which produce their young alive, one at a time, but in quite rapid succession. These in turn, in the course of a few days, begin to multiply in the same way, and so on, for five or six generations, all being females. Then a brood will be produced, also all females, which will develop wings and fly away from the plant on which they were born, to spread their kind on other plants or trees. Towards fall a brood of the lice will appear which are the true males and females, usually wingless in both sexes—the females invariably so. These lay the winter eggs. In a very few species the eggs hatch before cold weather sets in, and the young lice, fixing their beaks in the tenderest twigs, bibernate in a dormant condition. It has been very difficult to trace the life history of these insects, owing to their peculiar and varying modes of development. It was, until very recently, supposed that the winged insects were in all cases the perfect males and females; but the observations of French and German entomologists, and of Prof. Riley, Mary E. Murtfeldt, and others of our own country, proved that this was a mistake, and, by means of numerous and careful investigations, ascertained the true history of the most important species.

Grape Phylloxera.

Of all the insects of this group, the Grape Phylloxera, one of the most minute of all, has done the greatest amount of damage and has proved the most difficult to cope with. Millions of dollars have been lost to this country and to Europe through its ravages, innumerable families have been impoverished by it, and hundreds of thousands of dollars have been expended in investigations and experiments for a remedy; but all without avail. It is very humiliating to have to acknowledge that the will, ingenuity and skill of man should be baffled by a tiny insect like this; but such is the case. In this country, where it is a native, it does not do so much harm. It only entirely prohibits the growing of European grape-vines, which would otherwise do well here and add materially to our resources and luxuries. Our native vines although attacked by it, have greater powers of resistance and usually produce quite well, if the season be favorable, in spite of its galls on the leaves and the swellings it causes on the roots. Its evil effects have been most severely felt in the wine-making districts of France, where it was unconsciously introduced on the roots of grape vines sent from America. Within the last ten years it has blighted the majority of the vineyards and caused very great financial distress among those dependent upon wine making for a livelihood. The French government and the various scientific societies have appropriated large sums of money for investigation and for the discovery of a *certain* and *practicable* remedy, in which the best naturalists and chemists of Europe have interested themselves. And the same has been done in this country. But as yet, no reliable remedy has been found. The insect that has attracted all this attention is an almost microscopic, yellow louse, that feeds for the most part upon the fibrous roots of the grape, causing, by its irritating punctures, knotty swellings, which, after a time, decay and cause the roots to slough off, thus in time, killing the plant. It also affects the leaves, forming on them great numbers of small, warty galls in which it hides itself early in the season and breeds. On some varieties of grape it confines its attacks mainly to the leaves, and to such it is least injurious. These are usually smooth-leaved varieties, such as the Clinton, Herbemont and Taylor. The Delaware is seriously affected on both leaves and roots, but recovers itself better than most varieties. The Concord has woolly leaves and is not commonly much infested with galls, while its tough roots also resist well.

Irrigation, where possible, and the application of lime, sulphur and ashes, although they will not exterminate the insect, serve to keep it somewhat in check, and aid the plant to recover from it injuries.

Woolly Apple-Tree Louse.

The woolly apple-tree louse (*Eriosoma pyri*, Fitch) is another very pernicious species, affecting both leaf and root, and doing most damage underground, where, by sucking up the sap that should go to promote the growth of the tree and the fruit, it causes the leaves to turn yellow and the fruit to drop. Its punctures cause large, knotty swellings on the roots, from which rot soon sets in, and the tree perishes. This plant-louse is quite large—the full grown females being from one-fifteenth to one-twelfth of an inch in length, and the wings expanding one-fifth of an inch. It is of a pale, purple

color, and usually enveloped in a fine cottony matter of a bluish-white color. It has no honey tubes.

The best mode of extermination is to uncover, as far as possible, the diseased roots and drench them with hot water. Mulching with unleached wood ashes is also good.

The leaves of our plum trees are subject to the attacks of a darker-brown, smooth aphis, which, when it appears in such numbers as it did last summer, checks the growth of the tree, disfigures it and seriously impairs the quality of the fruit. I do not know that any artificial remedy has been tried upon it. Syringing with weak carbolic acid, whale-oil or soap-suds would doubtless destroy the pest.

Green Louse on House Plants.

One of the plant-lice that gives most trouble, and probably attracts most general attention, is the "green louse" or "green fly," so troublesome to window plants and hot-house plants, and often to roses planted out in the garden.

The usual remedy is smoking with tobacco; but it has been discovered recently that dusting with the Persian Insect Powder, or syringing with a tea made from the leaves of the tomato plant, are complete remedies, and in some cases preferable to the use of tobacco. Dr. Hagen, of Harvard University, claims that drenching inf sted plants with water in which a little *yeast* has been dissolved will produce in the lice a fungoid disease that will soon exterminate them. These new remedies are simple, easily applied, and cannot possibly harm the plants experimented upon.

Gall-Making Lice.

One of the most interesting groups of the *Aphididæ* is that containing the gall-making species. The punctures of one of these *Colopha ulmicola* cause peculiar excrescences on the leaves of young elm trees, which, from their form, have been called "cockscomb elm-galls." They are somewhat puffy, and when opened, are found to be inhabited by large colonies of purple, downy lice of all sizes.

Two species (*Pemphigus vagabundus* and *P. populi-monilis*) infest the cottonwood, the former causing a large fruit-like gall on the twigs, and the latter a row of bead-like swellings on the leaves. Another species (*P. rhois*) produces a large fungus-like gall on the sumac; and still another (*P. populi-transversus*, Riley,) forms a hard, roundish, nut-like gall on the leaf-stalk of the poplar.

Natural Enemies.

All plant-lice, in whatever situation they are found, have their natural enemies. Minute *chalcis* flies lay their eggs in their bodies, from which hatch maggots that feed upon their vitals and shelter under their distended skins. The fierce and active larvæ of the Lacewing fly destroy hundreds in a minute, while the less active but no less greedy young of several small beetles, belonging to the family of Lady-birds, gulp down countless numbers. Many other predacious insects, as well as spiders and some small birds, seek them eargerly and make short work in dispatching them.

Were it not for the aid thus received, in keeping them in check, we should be powerless to preserve our crops from wholesale destruction by these insignificant robbers.

DISCUSSION.

Mr. Brimhall. I move that the paper be accepted and placed on file for publication.

Mr. Harris. I move that the paper be received, placed on file, and a copy be given to the papers for publication.

Mr. Dart. If this motion were put without the last condition, our Transactions might come out sooner. Have heard some complain that we don't get them early enough. A resolution to get the Transactions earlier would suit me better.

President Grimes. Think it would be proper to tender a vote of thanks to Mr. Mendenhall for giving us such a valuable paper.

Mr. Dart. I would move to that effect.

Mr. Dart's motion was seconded by Prof. Lacy, and carried unanimously.

Tomatoes to Keep Off Plant-Lice.

Mr. Gibbs. Would like to ask Mr. Mendenhall whether he ever tried tomato-plants near grape vines? Have read that where these are near plants the smell will keep the insects away.

Mr. Mendenhall. Have tried tomatoes and beans also. Beans just dropped between watermelons will keep some insects away.

Mr. Harris. Have tried them around my trees for borers, but whether they did any good or not, I don't know, for I was not troubled then, nor since that time.

Mr. Eldrige. I know lice were on my trees as bad as ever, although I had potatoes around them.

Floriculture.

The next business taken up was the discussion of questions relating to floriculture.

The Secretary. Some subjects have been submitted to the Society for discussion, as follows:

1. Is not temperature and water of more importance to most house plants than soils?

2. Is soil of different mixtures and fertilizers of much importance in the culture of house plants?

3. Is there any way of covering plants and shrubs to insure them against the variableness of the winters?

4. Are plants and shrubs grown in the same latitude as this more likely to prove hardy and do well than those grown in another?

5. Is there any method by which we can successfully cultivate Japan Lillies here?

6. Are different Roses more suitable for different climates and soils than others?

7. What Roses are most satisfactory of the Perpetuals?

8. What Tea Roses are best for house and garden?

Mr. Harris. It would have been much better if those subjects had been given to persons three months ago for papers. It is very difficult to jump from bugs to posies and do each justice. Could answer most of these questions with yes or no. But would want time to discuss them and say all I can. The first question is an all-important thing in producing good plants.

For almost all plants a good garden soil is best. Keep the right degree of warmth and give the plant enough water, and it will succeed. Don't think it requires better soil or more skill to keep plants in a small conservatory than it does to keep them in a large one. Keep off the insects and the plant will look healthy. If I were going to plant hybrid roses I would plant the General Jacquanot. The usual difficulty is to give them good protection. Roses can frequently be covered with inverted sod. Some people protect theirs with inverted boxes. Some roses that are suitable for different climates would do well without any protection. On the other subjects I don't wish to say anything now.

Mr. Smith. Would say that I have had no trouble with the Japan Lily. I raise the bed a little and plant about six inches deep. Have some in the flower bed that have stood for years. I usually throw leaves, straw or manure over them in the winter, and they keep well.

Mr. Gibbs. Have very little trouble in protecting my rose garden. Many lay the bushes gently to the ground, fasten them there, and then cover them with clean straw. The moss roses, Princes, Adelin, (?) and a number of others, I have never had winter-killed when cared for. To keep the straw on the bushes put boards or stones on it.

Mr. Harris. Madam Plantier is a very profuse bloomer.

Mr. Gibbs. We have often lost plants by rotting if left covered too late in the spring. I attribute the rotting generally to covering too deeply in the fall. By covering lightly I have always saved the plants.

Mr. Pearce. Have had a little experience with roses. With me the most effective protection is covering late in the fall, first

laying the bushes down carefully, putting dry boards on them, and then covering with light soil. Have tried straw and other modes, and sometimes failed. But if the wood is dry that one covers with, it is always a success.

Mr. Mendenhall. We have a lady in this city who has had a great deal to do with out-door culture of roses. Mrs.——— is the lady, and I would move that Col. Stevens be requested to ask her to prepare a paper on the cultivation of roses out of doors.

The motion was seconded and carried.

Pres. Grimes. I also have cultivated roses. I cut mine back eight or ten inches in the fall, procured some sod, threw it right around the crown to shut off water, and covered them well with good stable litter.

Mr. Brimhall. Would like to ask whether you served the young plants that way.

Pres. Grimes. I cut back only the old ones.

Mr. Storrs. Have protected best by covering with sod. Have had some totally killed that I covered with straw and other material.

Mr. Smith. Wm. King, of St. Paul, took boards and put stones on them, and the plants so covered came out better than ever before.

Mr. Storrs. Have killed mine with manure.

The Secretary. Isn't it a good deal safer to buy plants grown in our own latitude?

Mr. Harris. Of course.

Mr. Mendenhall. I move the first question be referred to Mr. Lacy to be reported on next winter.

Mr. Carter. Have raised the Golden-Banded Lily and had trouble with it; but the Red-Spotted, White and Brown, I could raise without trouble.

Mr. Smith. The great fault of the people is they won't plant deep enough on drained soil.

Mr. Harris. Is sandy soil as favorable as loam? Am inclined to think it is not adapted to Lilies.

The discussion on floriculture was here closed.

MR. JORDON'S PAPER.

Mr. Jordon then came forward and read his paper on Blight, its Nature, Cause and Prevention, as follows:

BLIGHT,

ITS NATURE, CAUSE AND PREVENTION.

Since the fall of our first parents, in the Garden of Eden, and God said to man, "Curst is the ground for thy sake, in the sweat of thy face shalt thou eat bread, till thou return to the ground," man has ever found an enemy ready to take from him his bread or his fruit.

Nature.

The common term blight, Webster says, is "decay or blasting, whether occasioned by insects, fungi or atmospheric influences." Woodward says, "This vapor blasts vegetables, corn and fruit trees, and is sometimes injurious even to man." Johnson, in his Cyclopedia, says, "Before effects were traced to their causes with the same care they are at present, blight was attributed to some mysterious influence in the air, to wind, or thunder, because these states of the atmosphere commonly accompanied this phenomenon. By investigation it is found to be parasitical fungi, of which a certain state of the atmosphere often contributes."

Cause.

The nature and cause of the blight is so lttle understood that in trying to speak of its nature, I have said about all that is known of its cause, which is supposed to be animalcule fungi or a fungus disease.

It is one of those diseases of the plant, like the trichina and cholera in hogs, and yellow fever and the black plague in the human family—but little understood.

The Remedy.

While it is very important in most diseases, in order to find a remedy, to first find the cause, it is not always so easily done, and we are content for the present, to find a remedy for this disease, which, if not checked, may cause the extermination of our fruit trees.

For the purpose of protecting my trees from the borer, and making them more healthy, I commenced whitewashing my trees, bodies, crotches and well up into the limbs, with quick-lime and soft soap. This did not prevent the blight, for I had it every year in my orchard. Two years ago, seeing sulphur recommended as a wash, I used the lime and sulphur with the most favorable result. I use four parts of lime to one of sulphur, putting in the sulphur when the lime is at its greatest heat slacking—making this wash about the thickness of paint. I paint my trees about the first of June. An article in Purdy's Fruit Recorder of June last, says that blight can be controlled with such certainty that it is a mark of shiftlessness for a man to allow his trees to blight.

The common remedy recommended is the same as I use. One writer in the January number of the Recorder, says he has kept his trees entirely free from blight for the last ten years by using copperas water, thickened with lime or sulphur.

Copperas may be a disinfectant without the addition of the sulphur.

Either article is cheap, costing from six to eight cents a pound at the drug stores. The result of the sulphur with me has been, in '78 not a twig of blight in my entire orchard.

In '79 the blight was the most destructive ever known in this section. I think I am safe in saying that there was not an orchard nor a yard containing two or more Transcendents that were not affected by the blight. Many trees were entirely killed, yet in my 100 acres of orchard, and having Transcendents in every block of orchard, as many have been set for top grafting, there was no blight till late in the season, the rain having cleaned the trees of the wash, the tops of a few trees began to blight, and I dusted them while wet with sulphur and lime, which stopped the blight.

Trees not Affected with Blight, Soil, Etc.

There is a great difference in varieties blighting. The Duchess of Oldenburg, Wealthy, Tetofsky and Haas, are amongst the hardy varieties least liable to blight. The Duchess seldom, if ever, blighting enough to injure. The crabs or hybrids as a rule are more liable to blight. Among those least affected are the Orange, Beecher's Red, Conicle, Gideon's Florence, (No. 3), and Early Strawberry. Those most liable to blight are General Grant, Transcendent, Hesper Rose, Hyslop, &c.

In location and soils, taking the years together, I see not much difference. Subject always to the following: Any location, condition of soil or cultivation that is likely to stimulate a fast or an unnatural growth is likely to cause trees to blight. And wherever the conditions are such that the growth is the most checked or retarded, the blight is least likely to occur. As root pruning, which stops entirely the growth of the tree, also entirely checks the blight. So the seeding down of an orchard has some influence in checking the blight; yet I would not recommend root pruning nor seeding down for the blight, except in extreme cases, but use the wash once or twice a season, and if it still continues or appears, dust the trees with dry lime and sulphur.

E. B. JORDON.

ROCHESTER, MINN., Jan. 20, 1880.

Mr. Dart moved that the paper be filed for publication, which motion was carried.

PROF. BUDD ON APPLE-TREE BLIGHT.

The Secretary. I have here Prof. Budd's article on blight, College Quarterly, and if it is the desire of the soceity to pursue the subject, I'll read it.

Many expressing the desire to hear it, the secretary read the article, which was as follows:

The unusual prevalence of this disease the current season brings us many queries as to its cause. Correspondents west of the divide report extended and ruinous losses in nursery and orchard. For instance, L. D. Frost, of Cass county, reports his two-year old nursery trees "looking as if fire had run

through them. The most of the trees are dead, root and branch. When the diseased condition was at its worst in June, an unpleasant odor was wafted on the breeze to a considerable distance. The grafts planted last spring are all right. An older nursery, somewhat neglected, and covered last season and this with a growth of weeds, is but little affected. I have thought it possible that too rapid growth had something to do with it, but if so, why do our orchards in Bluegrass sod blight so badly? The crabs were the first to blight. Please give us such light as you can."

On page 168 of the Iowa Horticultural Report for 1877, the writer presents the results of long-continued observation and experiments, supporting the idea that our excessive heat of soil and lower beds of air in orchards on dark-colored, exposed soils, is a probable cause of this and other orchard troubles. The French gardeners talk of "*coup de chaleur*"—stroke of heat—in connection with apple, pear, and plum trees becoming diseased, when standing on the sunny side of high walls where the reflection of the sun's rays creates an abnormally high temperature within the tree. The great French physicist, Mr. Becquerel, records, as the result of carefully conducted experiments, that an internal temperature of the plum tree of 98 degrees Fahr., in August, when the cells of the newly-formed wood deposit are becoming solidified and freed from watery particles, always results in diseased condition of the tree, and usually in death within a short time. In other words, he found that a temperature of sap-wood exactly favorable to most rapid growth of semi-tropical plants, would produce disease in, and death of trees indigenous to the north. We also agree that our varieties of the apple from Siberia, and their crosses retaining the Siberian form, are first to exhibit traces of the blight. They are capable of enduring our test winters, but they know nothing in their native country of our summer-heat of soil and air. The varieties of the apple we receive from the interior of Russia, with the thickened epidermis of leaf and bark developed in the course of generations by their dry, hot summurs, are less subject to blight, even in positions where they must endure a temperature some higher than is natural. Our varieties imported from England, or other portions of southern Europe with cool, moist summers, as we might expect, are variable as to their capacity to endure our summers or our winters, just as their structure is varied by their origin.

The idea is perfectly illustrated by the varieties and behavior of the wheat plant in various portions of the world. In more equable and regularly humid climates the forms of disease engendered by our arid summer-heats are unknown, while at Xalapa, Mexico, "wheat will not mount into ear, but produces a low-growing grass." Lindley lays down the axiom in Horticulture that "all plants require the soil as well as the atmosphere, in which they grow to correspond in temperature with that of the countries of which they are native." Yet he devotes a large part of his "theory and practice of Horticulture" to the means at the command of the gardener for the modification of natural conditions of soil and air by artificial means.

In our orcharding we cannot modify soil and air conditions as we do with glass structures, shading, etc., with our flowering plants, but by selection of varieties, position, and treatment of surface soil of our orchards, we can control the summer temperature of our trees sufficiently to exempt us from serious trouble in the way of blight. As an instance of surface modification,

Dr. Ward of New Jersey, a number of years since commenced the plan of cultivating his pear orchard early in the season, and covering the whole surface with marsh-hay in July. His orchard has since borne fine crops and been very nearly exempt from blight. His neighbors, following his example, have had equal success, while the skeptical ones, having other theories in regard to the cause of the disease and keeping on in the old way, have lost their trees. Thomas Meehan, while believing in and teaching that blight is caused by fungus development in the tissues, yet, for many years has continued to point out the fact that wherever he has gone, east or west, apples, pears, peaches, raspberries, and plums, that "have somehow got out of the ruts of what is sarcastically called cultivation, and into some happy spot where they can push their roots on a nice, cool, shaded, and regularly humid surface," are uniformly healthy and productive. We can only summarize our prairie experience by saying:

1. Apple trees blight least on light-colored soils, in elevated, airy positions.

2. We find a wide range of varieties to fatally blight on dark-colored, exposed soils, in sheltered positions.

3. We find the disease confined to few varieties, and to assume less serious form, in orchards with surface shaded in August by a succulent second-growth of clover.

4. We rarely find a blighted twig in an orchard or nursery with its surface covered the preceding season by a thick growth of buckwheat.

5. We note little blight in orchards where a coating of weeds and rubbish are lightly turned under in June, followed by a growth of succulent weeds in July and August.

6. Orchard trees kept whitewashed on the trunks and main limbs during the latter part of the season's growth rarely show traces of blight.

In all these cases we can readily trace the cause of blight to unnatural heating of the internal structure of the trees during the season when the newly-formed wood and inner bark are maturing. Earlier in the season the forming cell-structure is loaded with fluids and seems little affected by excess of heat. We have neither the time or inclination to speculate on the exact manner in which an internal temperature of 95 to 98 degrees works injury to the maturing cell-structure of the English Golden Russet or Transcendent Crab, while an internal temperature of 120 degrees may not injure an orange or a fig at the Cape of Good Hope. We fully believe the damage is done at the time and in the way indicated. If the damage is specially severe, the visible results may appear in patches of discolored bark the same season. But almost as a rule the sap ascends in the wood of the older growth, as it will do in rabbit-girdled trees, and the trees make about their usual extension of apparently healthy growth. Earlier or later in June, according to the season, the time arrives for new wood deposit over the injured cell-structure of the previous August, when the blight appears *just where we may expect it, in the growing points immediately in communication with the forming cambium layer.*

We do not expect at once a large number of believers in this simple theory of blight. We only ask that it be carefully investigated. But apparent exceptions must be carefully studied. Trees standing near buildings, surfaces of exposed soils, or with other conditions where an internal heat

of 98 degrees may be engendered, may blight, if the surface under them be covered with clover, buckwheat, or mulch of any kind. We will only add that an orchard of over 1,000 trees, consisting of 118 varieties, on the College Farm, has had its surface cooled by a crop of buckwheat for three successive years, and not a blighted crab or variety of any kind can now be found. The situation is eminently favorable to blight, and prior to this period of special treatment of surface soil, with intense heating consequent on open exposure to the sun, but few varieties escaped damage by blight in June. The College nursery contains about five hundred varieties, about all of northern parentage including many of the new crabs of Vermont, Minnesota, and Russia, yet not a single blighted twig can be found At the time of the last cultivation, early in July, buckwheat is sown to cover the surface during the last of July and especially in August and early September. We specially select buckwheat as a soil covering on account of the little trouble it gives, and its peculiar and little understood capacity for maintaining beneath it a cool, moist, friable soil.

DISCUSSION.

Mr. Harris took exception to the statement in regard to wheat-bearing grass near Xalapa, in Mexico.. He thought it not true.

Mr. Jordon. There are a number of things in that article I am inclined to doubt. The two years I have used sulphur I haven't had a blighted tree. He also says where the ground is shaded the trees are less liable to blight, while I think I have seen bushes and trees blight more in the shade than in open places.

Mr. Dart. Blight has been a great lion in the way. Have found out there is a set of varieties exempt from blight, and among them are some especially valuable to us. Think that our list formed a couple of years ago must be of considerable value to direct the people and us in planting. Think it better to consider that list and add new ones if we have any.

Mr. Pearce. For a few years I have settled down to the belief that it is a "fungus," and that all trees are liable to it. Certain trees are wonderfully powerful in throwing it off, as Duchess of Oldenburg. Blight seldom touches it. Think it proper to select such trees. It is not always the tree that grows the fastest that has the best constitution. I think it is just the opposite. I attribute the rotting of fruit to this fungus nature. Have settled down to the belief that the tree and fruit are affected by the same fungus.

NEXT ANNUAL MEETING.

Mr. Hollister. Move that the next order of business be the location of our next annual meeting.

The motion was carried.

Mr. Carter. I move that it be held in St. Peter.

The motion was seconded.

Mr. Dart. I have no motion to make, but I am authorized to invite the Society to Owatonna. Don't know of any bad treatment the members received there, though I was not quite satisfied myself The people didn't attend the meetings enough. But I think they will treat you better this time. The people will attend more; they have become more interested in the Society.

Mr. Pearce. I well remember we were well entertained at Owatonna. Would be much in favor of going there; but we have been there, and think, for doing good, it would be well to go around like the Methodist preachers.

The Secretary. I well remember Owatonna and Rochester, and think we might accept the invitation of St. Peter.

Mr. Harris. Are there any prospects of getting a reduction of fare on the St. Paul & Sioux City road?

The Secretary. Never had a reduction over that road yet, because we were never assured that any one would come over that road.

Mr. Pearce. Never heard of any difficulty in getting one-half fare over that road at points where agents can negotiate with the officers of the road; and think it would not be difficult to obtain half-fare tickets.

Col. Stevens. Think we never had any difficulty with any road but that, and I think they probably won't give us any reduction.

Mr. Carter. They have always been very liberal to nurserymen. They carry planting trees, &c., free of charge.

Mr. Gibbs. Have no doubt but that we would have "ample receptions" at any of these cities. But I think, for the good of the Society, the meeting ought to be at St. Paul or Minneapolis.

Col. Stevens. If the Society should vote to come to Minneapolis, they would be freely and gladly entertained.

Mr. Mendenhall. Move, as an amendment, that we come to Minneapolis.

The motion was seconded.

It was then moved and seconded that an informal ballot be taken.

Mr. Hollister. A member spoke about *commencing* this going around. I think it has always been so. One object of moving about is to get up an interest among the people by going to different places. This is the only way we can create an interest in small towns. If we stay here we will get no new members. We may get some somewhere else. It strikes me we ought to consider

the attendance and getting of members. In this respect none would compare with Owatonna. Owatonna is more convenient than St. Peter.

Mr. Eldridge. If we move to St. Peter, we have greater expenses. More of us have business here, and hence, this place draws larger crowds. And it seems that the interest depends on the number of persons. Think St. Peter will be tame.

Mr. Jordon. Think we ought to make the meetings as interesting as possible. Would like to see the society at Rochester. But here we have the papers, and there are more fruit growers immediately around St. Paul and Minneapolis. Will these go to those far-off places? And since we have had such a warm welcome, we certainly can pay our little fare and come here.

Mr. Pearce. Came here a year ago and I am fascinated with the place. Am a little acquainted on the other side, not much on this side. Mr. Pearce then told how willing the President of the University, the Governor, and others, were to entertain or pay the boarding bill of some visitors. This gave courage and made me think there were lots of live people here. Should like very much to have the meeting here next year. This is a central point.

Mr. Sias. Don't exactly understand what he means by lots of live people being here.

Mr. Pearce. I meant there was a great many men who had confidence in this society. At other places many thought we could spend our time better.

Mr. Dart. One argument in favor of this place was the members here wouldn't go to Owatonna or St. Peter. If this is true, they haven't as much horticultural stamina as those at Owatonna or St. Peter, for they come here. I did the begging at Owatonna and will stand good for a good reception this time. Have you evidence that the labors of the large number will do better than those of the smaller number forming the back-bone of the society? This means that we should carry out the idea, "To him that hath shall be given, and from him that hath not shall be taken." I don't believe in it. You can entertain better here, because you have better facilities for it, but Owatonna can compete with any other place, St. Paul not excepted.

Mr. Hollister arose to invite to St. Paul, but being somewhat interrupted, after some confusion he was able to say: I was going to say we weren't ashamed to have you come there.

Dr. Twitchell. Think it is not so much the expense of coming here as it is a desire to come here. Four will come here while one will go to some other place.

The Secretary. Think the one argument of the proximity of the legislature is enough.

Mr. Brimhall. I am not in favor of riding a free horse to death, but the invitation is so warm and the interest so great, that I think it best for the society to come here.

Mr. Dart. One point you will please consider, that this meeting being in Minneapolis now, nearly all the members live here—where is the chance for the small minority?

The informal ballot was now taken, and resulted in 18 for Minneapolis, 3 for St. Peter, 1 for Owatonna.

The motion was then unanimously carried in favor of Minneapolis.

Mr. Mendenhall. I invite all the members to bring their wives with them.

Mr. Smith. I suggest the Minneapolis men bring their wives first.

UNTRIED VARIETIES.

REPORT AND DISCUSSION.

Mr. Fuller. Move we take up the report on the Purchase of Untried Varieties of Fruits and Plants at Fancy Prices. The motion was seconded and carried.

Mr. Harris. After a great many interruptions two of the committee have prepared a report.

The report was read, and a discussion with amendments followed.

The report contained the names of certain parties, and a motion to strike these out of the report was seconded and carried.

Mr. Fuller. If we should designate or locate these parties it would be better.

Mr. Pearce. Think it's a very knotty question, and difficult to know what course to pursue. I believe those swindlers were equal to highway robbers. It is my opinion they didn't represent any nursery, but were working on their own hook, and that the trees mostly came from Wisconsin. Believe they took their orders and filled them regardless of variety. It's those men that don't represent anything—that have no honor and no principles—that we wish to circumvent.

Mr. Fuller. The agents of the Heikes Nursery, Dayton, O., give all the guarantees mentioned. They have been carrying on business for years and give any amount of warrants. But they

never come around but once. They said they took $8,000 out of this county alone.

Mr. Dart. There is a class in our own State that deserves to be hit. I call them scalpers; they are canvassers. They will perhaps write to Rochester to see how they can get trees there. Then they go canvassing, take all the orders they can at reduced prices, and after they have a great many orders they come down to business. They ask the Rochester nursery "What will you give us this quantity of fruit trees for?" If the figures are not entirely satisfactory, they write about to see where they can get the best bargain. The final result is they buy where the trees are cheapest and where they can make the most money, and many times they sell the wrong variety.

Mr. Ford. Don't know as we can get anywhere near the evil; and it has been so a great many years. The Ohio concern is about the worst I ever heard of. They will sell and get big orders on the Lady grape, strawberries, &c. The fact is the people couldn't get rid of them without buying. Have heard them make the boast that they carried $18,000 out of Hennepin county?

These Ohio chaps have been all around the country. This whole thing is robbery. Know of roses that have been sold at enormous prices, while our nurseries could furnish them fresh and good at low prices. They have sold immense quantities where I couldn't sell a dollar's worth. If this society could stay that evil only a little it would do a great deal of good. But I can't see how to do it, though I have thought a great deal over it. Thought perhaps a committee might be appointed to make some laws. It is the worst evil to work against that I know of.

Mr. Dart. Arrest them for obtaining money under false pretenses.

Mr. Ford. Who'll do it?

Mr. Eldridge. Let the one without sin cast the first stone. There are nurserymen in this State that send out their order books by agents, purporting to come from certain nurseries and saying their trees are all Minnesota grown. When the trees are sent for they come from Rochester, N. Y., or some other Eastern State. And there is a point on the exhibition of fruits I would like to mention. We have men here that exhibit fruit as grown here when it was grown in States far from here. This ought not to be so.

Mr. Brimhall. Think nurserymen ought to be held responsible for the contracts of their agents. Think we have nurseries here for

whose doings neither the agents nor the nurserymen are responsible. Best way is to have the people buy of the nurserymen; this is the best way to get out of the difficulty.

Mr. Dart. I call for the reading of the resolution to see just how it stands. Want to know what we are to act upon.

Mr. Gibbs. I move that we incorporate the words "in nurseries in latitude south of Minnesota." The motion was seconded.

Mr. Dart. I am in favor of leaving "all nurseries" out, for the reason that the nurseries were not responsible for the acts of the false agents.

Mr. Jordon. Have had a little to do with the Heikes Nursery Company. Wrote an article in which I mentioned the names of their agents, and received an answer that the names I mentioned were their authorized agents. It has been the habit of these agents to take the name of some prominent man and claim he had bought some trees or other plants from them. One man told me he bought $60 worth from a Quincy, Ill., company, and now his purchase wasn't worth anything.

Mr. Dart. If this is the case, then I would insert the words, "especially the Heikes and Quincy Nursery companies," and not get in hap-hazardly other companies.

Mr. Storrs. Think it is high time to do something. They are worthless fellows, and the only way to stop the fraud is to catch the fellows as they appear and put them into Stillwater.

Mr. Pearce. Believe I would just as soon take a Duchess of Oldenburg that was grown in Illinois, if properly grown, or a Tetofsky grown in Ohio, and plant it here as I would one grown in this State. Know a man that has Duchess from Blocmington, Ill., that are doing finely. If the variety is the true variety it is the same the world over.

Mr. Brimhall. It strikes me we have laws to arrest these agents and put them into the penitentiary.

Mr. Ford. Don't think a car load of resolutions will stop these chaps. If we would form a kind of a league that will just "go" for these fellows we might do something. The people can't get rid of these agents; they are worderfully smooth-tongued fellows. We will do forty times as much good as a league as we will with any amount of resolutions.

Mr. Jordon. If this body of men has any influence in this State let its actious go into print. It is a well known fact that all plants adapt themselves to the soil and climate around them to some extent. Consequently, plants cultivated in a different place

from where they were raised must either become acclimated first or be more liable to destruction.

Mr. Fuller offered this substitute: "From such establishments as the Heikes Nursery, of Dayton, O.," but it "was not accepted."

The Secretary moved, as a substitute, that the committee be continued and requested to confer with the executive committee as soon as possible. The motion was seconded but lost.

Mr. Storrs. Think it would be good to have every member publish these resolutions in his home paper.

The Secretary. I object to using names. I notice in the proceedings of other societies, all personal remarks are avoided. Don't want to get in too deep.

Pres. Grimes. Deep or shallow, I am apposed to personalities.

The report of the committee was carried with above amendments unanimously.

WHEREAS, Many of our people have, through the representations of unscrupulous nursery agents and tree dealers, been induced to purchase fruit trees, shrubs and plants at fancy or exorbitant prices; and

WHEREAS, We have the most conclusive evidence that scarcely one tree or plant in a hundred thus sold survives this climate longer than one year, and such as do survive prove not true to variety and of very uncertain value; and

WHEREAS, These unscrupulous dealers by this system of swindling are destroying public confidence by their wide spread sale of spurious and worthless trees at ruinous prices, greatly to the injury of both tree planters and the nurserymen of our own State,

THEREFORE, We, the members of the Minnesota State Horticultural Society, feel it our duty to issue this preamble and resolutions.

Resolved, That we condemn the practice of purchasing Russian and other untried varieties of trees and plants at fancy prices.

Resolved, That all nurserymen who send out agents, should in all cases expect to be fully and strictly responsible for all the representations, and to fully meet all the contracts made by such agents.

Second. That tree planters should, as a means of protection, demand of all who may solicit their orders for trees, unquestionable proof that they are the authorized agents of some reliable nurseryman, who grows his own stock, and that such nurseryman will hold himself strictly responsible for all the representations of such agent.

Third. That tree planters may reasonably look for all things that will succeed in this climate in the hands of the leading nurserymen of the State rather than in the hands of irresponsible traveling canvassers and tree peddlers, and that it may be taken as *prima facie* evidence of fraud when scarcity or extraordinary qualities of excellence are claimed for them, or when for the same alleged cause exorbitant prices are demanded for them.

Fourth. That the annual published Transactions of the Minnesota State Horticultural Society contain the experience of the best fruit growers of

this and adjoining States, and a carefully revised list of such varieties of fruit as are safe for this climate, therefore we recommend only the planting of such varieties of trees and plants as are found therein, except by those who have the disposition and facilities for conducting experiments with new and untried varieties.

Fifth. That newspapers throughout the State would protect their readers from swindlers and advance the cause of horticulture by publishing these resolutions.

J. S. HARRIS.

REMARKS OF COL. COLEMAN.

Pres. Grimes. I have the honor of introducing Col. Coleman, from Missouri, President of the Missouri Horticultural Society.

Col. Coleman. I will not bore you long with any remarks. I merely wanted to say it gives me great pleasure to meet you and see so much interest taken in the discussions. Have been a fruit-growing man all my life. Left my position as President of the Missouri Horticultural Society to attend the Amber Cane meeting, in which I have an interest. I feel that I am among my own people. Was raised in about the same latitude in New York. I have heard that some kinds of fruits couldn't be raised in Minnesota at all. It seemed rather strange to me, because those fruits used to be cultivated by some persons in the same latitude in New York. Was glad to see the resolution in regard to the frauds, pass. We are meeting with precisely the same experience in our own State. Scapegraces are selling useless trash, good for nothing, and the worst of it is that they often carry off immense amounts of money.

As I attended the meeting of the American Pomological Society, and by the way, we got the Wilder medal for the best exhibition of apples, some grapes, and pears, I heard this story:

Gov. Allen, who is now dead, was one who was always anxious to buy new fruits. And once he bought what was called the Custard apple. Next spring as he was going through his orchard he looked at his Custard apple and saw that it was a common Pawpaw, of which he could find plenty in the woods. Not long after this another man wanted to sell the Governor a fruit tree. This agent gave the botanical name, and the Governor being a lover of new fruits was persuaded to buy one. Next year he went out to see how the tree was getting along, and coming up to it, he looked, and with an oath, exclaimed, "I'll be damned if here isn't another Pawpaw."

Think something ought to be done to prevent it. It is getting money under false pretenses. But when it is brought into court, where are those that sold the fruit trees?

Gentlemen, I want to congratulate you upon the interest you take in this matter. The Almighty has given us these healthful luxuries (for the whole year), beginning with the strawberries early in the year, and going to the apples late in the fall and through the winter. They have become necessities to health in civilized nations. You are engaged in a noble work, in a humanitarian work, in a philanthropic work. And I for one, though from another State, am with you, heart and soul, and wish you God speed.

Was glad to be with you. But I felt somewhat like the poet with his two lovers—he could love either when the other fair one was not present. I came to attend the Amber Cane convention, but am very glad to be with you too. We also publish a report, about the size of yours, and our secretary would be very glad to exchange with you.

There is another subject that came up in our meetings before I left, and that is, the organization of a Pomological Society of the Mississippi Valley. I presume our secretary will correspond with you in regard to the matter: he has been instructed to do so. If such a society is organized, we should be very glad to have you with us. This Valley is united together by human interests. This society will be in no antagonism with the American Pomological Society.

I felt that I could not do more than express my gratification at being with you and expressing my gladness to see you take such interest. Thanking you for your attention, I will close.

The speaker resumed his seat amid warm applause.

TAXING NURSERY STOCK.

Mr. Fuller. I move that a committee of three be appointed by the chair to prepare a paper on Taxing Growing Nursery Stock as Personal Property, to present to our next legislature. The motion was seconded and carried, and the committee appointed, as follows:—G. W. Fuller, E. H. S. Dart, A. W. Sias.

THE CATALPA AGAIN.

Mr. Ford. I have a letter in hand from a leading man in Missouri in regard to the Catalpa.

Mr. Dart. I think the Catalpa has received all the attention it needs.

Mr. Ford. I would like to know whether it is hardy. Robert Douglas says it is not hardy above 40° latitude; but if the society has taken action on it, nothing more need be said.

REVISION OF FRUIT LISTS RESUMED.

The revision of the fruit list of yesterday evening was then resumed.

Rollin's Pippin.

Mr. Pearce. I move that we reconsider yesterday's action on the Rollin's Pippin. The motion was seconded and carried.

Mr. Pearce. I move that we place Rollin's Pippin on the list recommended for "general cultivation in favorable localities." The motion was seconded and carried—seven for and two against.

"For Amateurs and Pomologists."

Pres. Grimes read the list recommended for trial by amateurs and pomologists, and asked whether any one was desirous of striking out or adding any.

Mr. Harris. I move that we add the Giant Swaar to it. The motion was seconded and carried by five for and none against.

Mr. Jordon. Examined my trees of the Hotchkiss Greening last week and they were doing well, and I think it will be a good tree. I move that we add this variety to the list recommended for "trial by amateurs and pomologists." The motion was carried by 10 for and none against.

Mr. Emery. I move that the Winsted Pippin be added to the same list. The motion was carried by 9 for and none against.

Varieties for Top-Grafting.

Mr. Gibbs. I move, if there are no objections, that another class be made and recommended "for top-grafting on the crabs." The motion was seconded and carried by 14 for and none against.

Mr. Dart. A great number of classes or lists will tend to confusion and defeat the object of those lists. I move that the chair appoint a committee to report, immediately on the opening of the evening meeting, a list suitable for top-grafting on the crabs. The motion was carried, and Messrs. Jordan, Sias and Gibbs appointed such committee; but Mr. Gibbs was excused, according to his wish, and Mr. Martin Cook appointed to take his place.

The Secretary, Is it the intention of the society that Plumb's Cider be stricken from our lists? By the action of last night it was, probably unintentionally.

Plumb's Cider—Price's Sweet—Saxton.

It was moved and seconded that Plumb's Cider, Price's Sweet, and Saxton be placed on the list recommended for "favorable localities in southern portions of the State." The motion was carried by 12 for and 2 against.

Mr. Eldridge. My Plumb's Ciders have done favorably for the past few years.

Transcendent.

Mr. Emery. I move the Transcendent be stricken from the list recommended for general cultivation.

The motion was seconded.

Mr. Fuller. The Transcendent blights.

Pres. Grimes. I make as much money out of my Transcendent as I do out of any other fruit.

Mr. Brimhall. Believe the Transcendent will produce fruit enough to pay for the tree before any other variety. It is the best tree for profit and the market on the list of crabs.

Mr. Dart. You couldn't give it away in our section, if you just let the people know it blighted.

Mr. Gibbs. I move to insert, as an amendment, after the Transcendent, "where not liable to blight."

Mr. Pearce. Move as an amendment to put in "liable to blight" in brackets. This amendment was seconded and carried by 10 for and three against.

Power's Large Red.

Mr. Pearce. I move that Power's Large Red be placed on the list recommended for "general cultivation." The motion was seconded.

Mr. Pearce. Think it far superior to the Transcendent or Hyslop. It is perfectly free from blight, is of excellent quality, is a good cooking apple, and a wonderful bearer.

The Secretary. Can't say anything against it. My catalogue of varieties is imperfect; but if the tree I have in mind answers to that name, I like both the tree and the fruit.

Mr. Sias. I was the first to introduce it some 12 years ago. Got my trees from S. B. Parsons & Co., Flushing, New York. Received eight trees four years old. They began to bear the second year, and have borne ever since. It is as hardy as any Siberian. The fruit is a trifle smaller than of the Transcendent; it is finer grained, a better quality of fruit, and one of the best pie crab apples I have ever seen, and it is a more beautiful fruit. It is about two weeks later than the Transcendent. Is not subject to blight as I know.

Motion was made by Mr. Harris at our meeting at Rochester to put it on the list for "general" cultivation.

I shouldn't be afraid to put it there.

Mr. Jordon. Unless a crab apple has been nursed enough, I think it shouldn't be recommended. Have seen the tree and fruit every year on Mr. Sias's ground. If the tree is generally propagated it might be put up; if not, it ought not to be raised.

Mr. Sias. Mr. Jordon has the largest orchards in the State, and it is surprising to me that he hasn't it.

Mr. Pearce. The tree was brought here probably about 14 years ago. By mistake it came in a batch of trees received by —— ——, and it has always done well.

Mr. Dart. Unless we can have the testimony from new witnesses it is right where it was before. We should let it stand longer until we have new witnesses. Am in favor of leaving it where it is.

The Secretary. How long have they been bearing in this State?

Mr. Pearce. Know it to have been bearing for eight years.

Mr. Sias. Have had it bearing for ten years, and it has never failed.

Mr. Cook. Have been acquainted with it on Mr. Sias's orchard. It is hardy and a very prolific bearer. Should much prefer it to the Transcendent. Think it is very good. Have a few hundred in my nursery, but don't care about selling any.

Mr. Sias. That's the best argument in its favor I have heard.

The motion was lost by five against and three for.

A motion to adjourn till 7:30 P. M. was then seconded and carried.

THURSDAY EVENING.

REPORT OF AUDITING COMMITTEE.

The meeting was called to order by President Grimes at 7:30 o'clock.

Mr. Harris read the report of the Auditing Committee.

It was moved and seconded that the report be accepted and placed on file for publication, which motion was carried.

The report was as follows:

The Auditing Committee having examined the accounts of the disbursements made by the Secretary during the last fiscal year, and the vouchers accompanying the same, and find the total expenditures to be $36.21, all of which is properly accounted for, and recommend that an order be drawn on the Treasurer to cover the amount.

The committee have also carefuly examined the books and report of the Treasurer and find them correct—balance in favor of the Society of $60.17 in the treasury.

J. S. HARRIS,
A. MORSE.

Mr. Harris moved that an order be drawn on the Treasurer to cover the amount of the Secretary's claim.

The motion was seconded and carried.

COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. Harris. The committee on the address of the President is not ready to report, and I think it would not be of any benefit to the society to report so late in the course of our meetings. There are some things in the address that require time to make a report on. The only matter we thought we could do anything with in this short time is the Dissemination of Horticultural Literature. I think it would be better to report at our next annual meeting. Therefore, if it is not insisted upon, we would rather not make a report now.

Pres. Grimes. If there are no objections the committee will report at the next meeting.

LIFE MEMBERS.

Mr. Harris. Our retiring secretary has served us satisfactorily for many years, and without pay. And as he now retires from office, I move we make him a life member. The motion was seconded by Mr. Mendenhall and carried unanimously,

The Secretary. Mr. President and gentlemen of the Society:

I can't make an off-hand speech, and I " won't " thank you for this as a compliment. It is more than a compliment. And I thank you for the expression of your satisfaction for my work from the bottom of my soul.

Mr. Brimhall moved that a life membership be given to our oldest member, Mr. Harris.

The motion was seconded and carried unanimously.

Mr. Harris. Mr. President, and gentlemen of the Society:

I feel that this is a sufficient compensation for all that I have endeavored to do for the society. Feel it as great an honor as if you had kept me in the highest office you can give. And I promise you my soul and heart is with you, and wish to see the Society prosper and stand as high as any of the societies of the States east of us.

The president shook the hands of the new life members and wished to see them remain with the society and continue their influence for it.

REPORT OF COMMITTEE ON TOP-GRAFTING.

Pres. Grimes. If there are any reports ready they are in order.

Mr. Jordon. The committee on the Varieties for Top-grafting on the Crabs is ready to report. The report was read, and a motion to place it on file carried.

The following is the report.

Varieties of apples recommended for top-grafting on crab trees:

For general top-grafting, Wealthy.

Varieties that make a good union on Transendent: Wealthy, Malinda, Plum's Cider, Rollins' Prolific, Ben Davis, Elgin Beauty, Utter's Red, Haas, and in fact most all fast growing kinds make a good union on the Transcendent.

Rollins' Pippin, top-works well on Hyslop and Duchess. While it does not make a tender sort hardy to top-graft upon a hardy crab tree, yet it necessitates hardiness in the fact that tender trees are most liable to kill in the body and crack; and if that be a hardy crab, the tree is thereby made hardier.

The best time for top-grafting is the first warm days that occur in February, March, or April. Never top-graft as the buds are swelling or leaves starting.

E. B. JORDON,
A. W. SIAS,
M. W. COOK.

DISCUSSION.

The Secretary. Seems as though it ought to call forth discussion.

Mr. Storrs. I have carried on experiments in top-grafting for six years. A year ago last spring I began to graft some cions. I commenced a few days after the first of February; grafted a few cions near the end of February; also some in March, in April, and in May, and kept cions in good condition in my cellar till June. Those grafted near the last of February did best; they grew about five feet. Those grafted in March grew a little less, and those grafted in June grew only a few inches; but they wintered as well as those grafted in February.

Mr. Jordon. Any hardy sorts can be top-grafted after the middle of January. I use for grafting wax three parts rosin, one part beeswax, with linseed oil to soften sufficiently to use. Have grafted in December that did well. Mercury going down to 20° does not hurt the grafting. In top-grafting orchards of Transcendents and Hyslops, remove the entire top and put in a new top. You have success only when you do the work completely.

FINAL RESOLUTIONS.

Mr. Gibbs. In the absence of the other two members of the Committee on Final Resolutions, I will read the report in their behalf. The motion to accept and place it on file for publication was carried. They were as follows:

The Committee on Final Resolutions recommend the following:

Resolved, That having repeatedly enjoyed the hospitalities of the city of Minneapolis, never given stintedly or grudgingly, new and hearty thanks are due and are hereby given to the people of this city for the use of the hall for our meeting, and for their generous hospitality during our present sessions.

Resolved, That the thanks of this Society be given to the daily newspapers of St. Paul and Minneapolis for their full and faithful reports of our discussions and transactions this year, and to the various railroads centering in the city for their reduction of fares to the members of the Society.

Your committee further recommend that a vote of thanks be tendered to our President, J. T. Grimes, and our retiring Secretary, Prof. Charles Y. Lacy, for their faithfulness and efficiency in attending to all the wants and interests of the Society within the range of their respective duties, and to our worthy fellow member, Wyman Elliot, for the generous exercise of his well known skill in arranging our fruits, flowers, plants, and products of the early amber sugar cane for exhibition.

Your committee beg leave to record a recognition of the increased strength and influence of the Minnesota State Horticultural Society, as apparent at this meeting, and would recommend that each member, on his return home, make special efforts in behalf of the objects of our Society in disseminating horticultural information through the local press, and in the organization of local horticultural societies, and to use his influence among his neighbors to procure a still greater attendance at our future annual sessions.

All of which is respectfully submitted,

G. W. FULLER,
OLIVER GIBBS, JR.,
G. H. FISH,
} *Committee.*

ARTICLES ON EXHIBITION.

The Secretary. I understand the report on Articles on Exhibition is ready.

Mr. Sias came forward and read the report.

Several members suggested the mention of some things that had been omitted.

The Secretary suggested that the beautiful motto on the wall should be mentioned in connection with the other articles.

Pres. Grimes. I think it should. It has been loaned to the meeting by Prof. Knerr, the acting Supt. of your public schools,

and is a motto we don't often see. It is a very rare motto. I understand it is made, that is the words are made, of ferns from South America.

The committee promised to make note of the things suggested, and the following is the report:

Mr. President and Gentlemen of the State Horticultural Society:

Your committee on Articles for Exhibition have made a list of the same, as follows, viz.:

E. B. Jordon, of Rochester, exhibits Ben Davis, Wealthy, Plum's Cider, Pewaukee, Malinda, Perry Russet, three unknown seedlings and Soulard Crab.

O. D. Storr, Winsted, specimen Winter Pippin, and Vandevere Pippin.

Dr. R. W. Twitchell, Chatfield, exhibited a very handsome apple of unknown origin and name, apparently a good keeper.

T. G. Carter, of St. Peter,—a fine plate of the Wealthy Apple, also a promising seedling from Andrew Wilfert, of Scott Lake, Le Sueur Co., and one other good seedling.

H. D. Eldridge, Excelsior, shows a large, fine seedling apple; color green; flavor, good; season, winter. By request of the originator to give it a name, your committee have named it *Eldridge.*

W. H. Johnson, Castle Rock,—five varieties of seedlings of good quality.

Wm. E. Brimhall, St. Paul,—St. Lawrence, Alexander and Wealthy.

J. S. Harris, La Cresent,—G. Russet, Ben Davis, Jonathan, Dominie, Walbridge, Winter Wine Sap, and three promising seedlings; also a fine plate of shell-bark Hickory Nuts.

Oliver Gibbs, Lake City,—fine plate Walbridge.

A. W. Sias, Rochester,—four plates Rollins' Pippin, one plate Giant Swaar, Wabasha, Rollins' Russet, Minnesota Greening, Ben Davis, one unknown, one plate Yellow Injestrie and four seedlings. Also, forty varieties of apple wood.

Ditus Day,—eight varieties apples, including seedlings.

Geo. Harkman, Hoka,—two seedlings.

Underwood & Emery,—Deorni, Quaker Beauty, Meader's W., and Jewell's Winter.

J. C. Kramer, La Crescent,—plate seedling grapes, Beauty of Minnesota.

Your committee believe this new seedling to be worthy of trial.

Wyman Elliot, of Minneapolis, exhibits a beautiful pyramid, made up exclusively of the Wealthy apple, "a thing of beauty" and destined to become "a joy forever" to every inhabitant of the great Northwest; a display that the "Goddess of Pomona" may well be proud of (or any other woman). This exhibition was surrounded and adorned by a beautiful display of plants and flowers as could be found anywhere, together with a rare collection of twelve choice new varieties of the potato, among which is to be found fine samples of the Beauty of Hebron.

G. H. Brackett showed a globe of gold fish, surrounded by a beautiful wreath, consisting of roses, carnations, bouvardia, etc., which was a thing of great beauty.

R. G. Mendenhall, Minneapolis,—fine collection of ferns and flowers.

Your committee will make no criticisms on this very excellent exhibition, except that if we should happen again to be placed on your committee we shall hope to have *more work* to perform, and be enabled to accomplish it in a more satisfactory manner.

Respectfully submitted,

E. H. S. DART,
A. W. SIAS,
M. W. COOK,
Committee.

COL. STEVENS A LIFE MEMBER.

Mr. Mendenhall. I feel a little bad about one thing, not that Prof. Lacy and Mr. Harris have been elected life members, but that our old brother, Col. Stevens, was not elected a life member. I move that Col. Stevens be made a life member. The motion was unanimously carried, and Col. Stevens was warmly congratulated by the President with a hearty shake of the hand.

Col. Stevens. I feel very grateful for this compliment, and indeed it is a compliment. I hardly feel worthy of it. Have noticed great progress in fruit culture since this Society began. And I believe that to the members of this Society all honor is due for the increase of these products. "Again thaking you for this honor" I will close.

THE TRANSACTIONS.

Mr. Carter. Would like to ask the Secretary whether he couldn't have the Transactions out this spring?

The Secretary. There never was a meeting in which I haven't had the intention to have them out within a month, but I could never get them out in that time.

Pres. Grimes. You must remember that Prof. Lacy has work besides this that must be attended to.

DR. TWICTHELL'S PAPER.

The motion to proceed with the regular order was carried.

Dr. R. W. Twitchell, of Chatfield, then came forward and read his paper on

HORTICULTURE.

Moved and seconded to place the paper on file. The motion was caried. The paper was as follows:

God doeth all things well. He did not consider his work complete until He had planted a garden, that, we are informed by the sacred historian, was in the east of Eden.

When man first awoke to consciousness he found himself in that garden, with no other companion except she who was to be the sharer of his every joy, and also of his every sorrow.

Eden was truly a horticultural paradise—a labyrinthian grove; among the branches and in the shade of which those sole occupants, almost in the very beginning of their existence, would fain have hidden themselves from Him whom they now had all reason for fearing was an offended father; for Him had they disobeyed.

This garden of the Orient, the leaves of which covered the ground—for it was autumn, balmy, seductive autumn—made a carpet softer than velvet, upon which they might have reposed, with none to molest or make afraid, had it not been disobedience. For, without disobedience, Satan would have been banished, and God only would have remained. A fruit garden; every tree of which was laden with its precious burden, whose colorings were as beautiful as is the ray of sunlight after being dissolved into its primary elements by beholding it through the falling prismatic raindrop.

Bending with all this weight of fruit, ripe, juicy, aromatic, luscious and healthy, which seemed to say to the master of the garden, approach, partake, eat and be filled. God also, had but lately said: "Of all this abundance may ye eat, excepting only the tree that is in the midst of the garden, of it ye shall not eat, neither shall ye touch it, lest ye die."

With this prelude, fanciful at least, and to dispute the reality of which will not add to the interest or validity of the subject, I propose to present a few ideas having for their consideration

Fruit Growing as an Occupation;

and, inasmuch as the apple is of all fruits the most to be desired, so, also, it shall claim most of my attention.

Mr. President, Ladies and Gentlemen—Before entering upon the merits of my subject, I will declare, for the encouragement of such as may be but just engaging in fruit growing, that now, while the sun of my life is past its meridian; while I have nothing to fear from the uncertainties that beset youth; with a lifetime of diversified experiences vividly recollected; having been inspired by hope and ambition to develop every faculty; having met at times with successes that have sharpened energy; and, also, at other times with disappointments that have obtruded hope;—I do unhesitatingly say, that could I begin life again, this should be my field, and I would, with all of the past experiences before me, gird on my armor and buckle to the task, with more zeal, with greater energy, and with more reasonable expectations of success than when, forty-six years ago, then a lad of ten years, I obtained from a neighbor the first peach-pits to plant on my father's farm twelve miles away; or, when, two years afterwards, I walked that same twelve miles to get a half dozen fruit trees for the same purpose They were small, I carried them under my arms all of that distance. I was foot sore and weary on my arrival home, but I felt a boyish pride in my little treasure; which, during the next ten years was increased to the number of five hundred; which, in those days, was a goodly sized orchard, and that orchard to-day, with its herculean arms entwined together, is a monument to my first effort in fruit growing. But, more than that, I see every fall, in Chatfield, my

present home, barrels of apples marked Rhode Island Greening, Spitzenburg, Baldwin, Jeneton, Swaar, Golden Russet, besides many other kinds; and also, marked Chelsea, Michigan. And then I know that they came from the town of my boyhood; and that many of them must have come from the trees that many years ago my own hands planted. Then I feel that another is not altogether reaping of what by me was sown; I, too, am getting my reward.

When we have succeeded, as we shall by and by, in the not far distant future, in establishing the fact that we have varieties of our own raising equally good with those, and perfectly adapted to our soil and climate, then will our occupation, though none the less praiseworthy, be more profitable. Neither will our agents be obliged to go from house to house, and almost on bended knee entreat people, for experiment at least, to purchase a few of our choicest varieties, which in the end are only taken to get rid of the agent, who, the moment he is gone, they regret that they did not assist in leaving with the toe of their boot. But, as it was, they did not order without first getting a guarantee from the agent against everything, even to the hatchet of their hopeful George Washington. What Minnesota has already accomplished assures us, that all that we are now seeking for, will finally be obtained * * *. But for awhile we will dismiss this train of thought, to be resumed further on. And here I will say, that notwithstanding in my boyhood I entered with so much zeal into the field of fruit growing; notwithstanding I then planted a nursery, raised and sold fruit trees, with the proceeds of which I in part paid my way into another field of labor, it has not been my life work. Long before I laid aside the pruning, the grafting knife and the dibble; long before my father's household had been dissolved by marriages, by departures and by deaths, I had chosen for myself a different vocation. These remarks may appear entirely out of place. But, had it not been for my labors in another field, I could not now repeat with the assurance that I do. My life work, as some of you know, has been the practice of medicine and surgery; and in the discharge of those duties I have been brought into contact with every grade of society, and into relations with various degrees of intellect. From the man who by natural talent, united with untiring industry, had attained to the highest round on the ladder of fame, to the ignorant boor, who never had a dozen thoughts in all his life; from the man in squallor and in rags, who apparently never had an aspiration above the realms in which he passed his miserable existence, to the person whom by the prestige of his wealth, could lock the halls of justice, pollute those seated on its sacred benches, remove the bars that restrained the malefactor, and around whom fawning sycophants meanly bowed. Or, on the other hand, when, as is often the case, the possessor was among the wise and good, with his wealth he would make endowments, bestow charities, and by so doing relieve want and distress, thus causing the people with one accord to call them blessed.

But, some one asks, what has all this to do with horticulture? Much, indirectly. For I have always been able to observe that in whatever grade of society any person might be, he who adorned his home with fruit trees, vines and flowers, became by so doing, apparently, elevated above those who regarded not those things, but who were otherwise in the same station in life. The time devoted to such pursuits lifted him above his surroundings.

The man or the woman that loves those adornments that the God of Nature has given us for our good, is never altogether bad. The money king that with his wealth would corrupt society, would not bestow a dollar to aid in the perfecting of that most to be desired of all fruits, the apple. I hope to prove before closing this essay, that while cultivating fruit of all kinds is elevating in its tendency, the effort to develop the apple to its greatest perfection is most elevating, most ennobling of them all. And further, that apple-eating nations ever have been, and always will be, the only truly enlightened nations on the globe. And that civilization goes hand in hand, not with the pear, or the peach, or the plum, or the cherry, nor with the fig, nor the bananna, nor bread fruit, nor the thousand other fruits of barbarous and half civilized lands, that delight the eye and captivate the taste, but with the apple; and the degree of civilization exactly corresponds with the degree of perfection to which that fruit has been brought in that country; or by the relations of commerce because a regular commodity. Before accepting this theory, proof may be demanded. I will endeavor to produce it soon. But for a moment I wish to return to Eden.

We read, that "Man's disobedience and the fruit brought death into the world and all our woe."

Whatever may be the opinion of any one of us, or even all of us, in regard to whether that matter, as it relates to history is well founded or not, I wish to state that that fruit of which our many times great-great-grandmother partook, and of which she gave to old father Adam, after having eaten all, or nearly all but the core, was an apple. Nothwithstanding some sacred historians disclaim the idea of that having been the fruit of which they ate. But I can prove as satisfactorily, to myself at least, that it was an apple, as they can prove that they ever were in the garden at all; or even that there ever was a garden of that kind:—namely, tradition. And it must have been a good apple too, for it was planted by the hand of Him by whom they had but just been created.

We believe, as the record informs us, that Eve gave to Adam, and he did eat. Tradition says, that in attempting to swallow what our great mother had given him, it (as I said, being little but the core,) stuck in his throat and remained there, causing a lump, which lump has been perpetuated even down to the present time. Now, science, in commemoration of that event, acknowledging the truth, has anatomically given it the euphonic name of Pomeen Adami, or in plain English, Adam's apple. If not because of the event, why the name? Assuredly, not because of the appearance, for, in some of my good frends it looks more like a knot on an apple tree, than like an apple or the core of an apple even. But, enough of this, or I shall be called irreverent; and, inasmuch as I am a believer in revelation, I do not wish to be so understood.

I have refered to this for the sake of proving that, if by the partaking of the apple when it was forbidden fruit, man was debase; so also, by partaking of the perfected apple, not forbidden, and also, by endeavoring still farther to bring it to perfection he always has been, and always will be, elevated. It is the constant comparison of civilization.

To introduce every argument pertinent to this subject would require a volume. But inasmuch as time is wanting, and patience not always a cardinal virtue, I shall refer only to a few as they come to my mind. The first

history that we can get of the apple, other than in its uncultivated state, is about the year 45 B.C., when the Romans introduced it into England. The wild apple, similar to our own wild crabs, was plenty there then. And the inhabitants were but little better than savages. As we proceed we shall see what the apple did for England.

But before visiting those countries where the apple abounds, let us look at the degree of civilization where it cannot be grown, or, from some cause, it has not been propagated. First, Egypt, and the Barbary States bordering on the Mediterranean. They do not, although they might, raise the apple. There civilization to-day is but little, if at all, advanced beyond what it was in the days of Moses. Arabia, notwithstanding it was the birthplace of science, has lapsed almost into its primitive barbarism. England's rule in India has caused but little real advancement among the people. The cultivated apple does not succeed there. It soon degenerates, becomes acrid, astringent, and bitter.

Latitude and altitude undoubtedly define the limits of the successful growth of the apple; but races of men are not confined to latitude or altitude. Persia could, but does not, produce apples. Greece, in the same latitude with Persia, and which was at that time an apple-growing country, was so much farther advanced in civilization in the days of Darius, who, with his Persian millions, attempted to conquer that mere spot of Europe, that she only was able to furnish the historians to relate the humiliating defeat of his mighty army. All efforts to christianize Central Africa have, in my mind, proved only signal failures. Missionaries have only sacrificed their lives to the effort; and yet, for a period, it did seem that their labors in some places would not prove abortive, having so far succeeded as to teach them to read, and to acknowledge and worship the true and living God. But in an unforseen moment some wandering horde would swoop down upon them, destroying both books and worshippers, so that not one would be left to tell the sad tale of their destruction, and in a few years it would be entirely forgotten that a missionary had ever been among them. Of this I have been assured by a devout missionary who had passed much time among them, and whose field of labor is still there. But build railroads across their country, the altitude of which in the interior renders it certain that apples will thrive, plant out orchards, and thus instill into their minds habits of industry and love of home; then barbarism will disappear and Christianity appear in its stead. Without this, all the teachings and all the prayers of all the devout men in Christendom will accomplish nothing. But railroads, with cannon and the orchard, will do it. But without the orchard, never, any more than it has in Hindustan, that has been half civilized for the last four thousand years.

Our own Cherokee Indians are a home instance. As also are the Indians in New York and the provinces of Ontario,—by nature as savage as are any of the marauding tribes that at present threaten the lives of the frontiersmen. They are accustomed to eat of the fruit that grew in Eden, and by so doing they have become no longer barbarians, but men. Like other civilized beings, they have their halls, and courts of justice, and also a voice in the councils of the nation.

I said, a few pages back, that the apple was introduced into England by the Romans. Probably upon their first entry there, about in 43 B. C. Still,

it may not have been till 800 years afterwards, at which time it was introduced into Germauy.

Rome was then the "land of scholars, and the nursery of arms." At one time, to have been a Roman citizen, was sufficient guarantee for protection. Rome rested quietly on her seven hills, was mistress of the world. Profound in her philosophy, eloquent in her oratory, sublime in her poetry, rich in genius, great in her statemanship, she stood alone, the admired of all the world, without a model, and without a shadow.

Through the instrumentality of the Romans, the apple was introduced over all Europe. And to-day those countries, wherein the apple is the staple fruit, are most thorough in the general diffusion of knowledge. Great Britain, and the German Empire to-day, are first among the nations of the old world in their institutions of learning, in the supremacy of their laws, and in the wisdom of their legislators. Akin to them, as being untrameled in their religion, and universal in their system of education, are the Scandinavians. In the countries mentioned, the apple is more nearly the staple fruit product, together with a part of Russia, than it is in any other part of Europe.

Spain, with a climate and soil admirably adapted to the growth of the apple, either because of the abundance of her other fruits, or the natural idleness of her people, has never made any effort to develop, or even to raise the apple. And what is she to-day? Almost pauper in her finances, bigoted in her religion, treacherous in her friendship, weak in her statemanship; a fifth-class power, almost forgotten when the nations arbitrate, and whose principal amusement is the revolting and bloody bull-fight. But the vintages of Spain produce some of the finest of wines.

Austria, also bigoted in her religion, and trameled in her system of education, is as far behind her sister German Empire, as she is behind her in the cultivation of the apple.

Shall I refer to France, whose wine-clad hills constitute not only the pride but the wealth of her peasantry. In all of that country, apples are common, but her innumerable vintages causes the flow from her wine presses to be more abundant than is milk. And, what of her people? Vivacious, fickle, priest-ridden, with an uneducated peasantry, let us wait yet a little longer, before we pronounce them capable of self-government.

But, to-day, where are the orchards that were once so abundant among the Romans; Gone; cut down, dug up by the roots, and destroyed forever. The glory of Rome has also departed. Her columns and her altars are in the dust, yet beautiful in ruin. And she, together with Greece, are hardly more than cyphers among the factors of Europe.

But least it should be said that it is race that elevates, and not what is eaten, I propose to visit Japan, which is about in the same latitude of Persia. A few words will suffice: The Japanese, notwithstanding that for ages their ports had been closed to foreign intercourse and consequently they knew but little about the outside world, when their ports were finally opened, were found to be the most intelligent people of all Asia. To-day no people are more desirous of reaping the benefits of civilization. Like the rest of Asia, they are Mongols; unlike the rest of Asia, they desire to adopt the habits of the civilized world. They cultivate and eat the apple.

But now, having wandered into and out of Eden, and from thence almost

everywhere, I find myself again in Minnesota, and among plain and sober realities.

Yes, plain and sober realities. Here in Minnesota, with a climate so rigid that every kind of fruit, except that which is really iron-clad, must succumb to its frigid embrace, some of us are endeavoring to make fruit-growing an occupation. This, of course, includes not only the apples, but all other varieties of fruit, one of the most important being the strawberry. We have no reason to doubt but that all of the small fruits, with that care that the enterprising husbandman will always bestow, may be as profitably raised here as farther south. It does require more work, but the return will be commensurate with the labor. Better prices can always be obtained for such fruits here than where less labor is required for their successful growth. With regard to the strawberry, our native varieties are as fine as are the wild strawberries of any other latitude, while in our Hart's Seedling we have one that has already found a place among the very best of the cultivated kinds. That the strawberry can be raised with more certain and greater profits than any other fruit has yet been in Minnesota, requires no further experimenting to prove. It is a fact, now well established. And it is only necessary to see who are the principal consumers of that delicious fruit to determine what is its province in the role of civilization. But, as with the intellectual and moral faculties in man, its cultivation must not be neglected. Otherwise it will soon degenerate, and finally be more worthless than its wild cousin. But, as I have stated, it is with the apple that this paper has most to do.

Already has Minnesota succeeded in furnishing to the whole country apples not only valuable for their hardihood, but for their excellent eating qualities.

Necessity has been with us, as it is everywhere, the parent of exertion. Where every want is supplied by nature the energies become dormant. On the other hand, where nature is more tardy in her gifts, the energies are more sharpened. No fears, then, that our energies will become dormant.

What we now most need, is a fruit desirable for the table, and that will possess such keeping qualities as will cause it to last all the season through, and also hardy enough to withstand the greatest rigor of our northern winters. Which, the present winter assures us, will appear just often enough to wipe out everything not absolutely iron-clad. It is possible that among the many varieties of Minnesota's growth, that have already fruited, but that have not yet been fully tested, we may have that fruit. Many who are laboring for that purpose, are very sanguine that they have it. It is certain that we have got trees that are really iron-clad, and that we have fruit excellent in quality and long keeping. Whether the hardiest trees are the ones that produce the best apples, and also the longest keepers, is not yet satisfactorily settled. But if that union has not yet been secured, it assuredly will be. It may not be until after we have been forgotten. But, as assuredly as Eddison in the field of electricity has succeeded in making the electric light a success, so shall we, ere long, astonish the world with the fact that MINNESOTA has succeeded in producing, not only the hardiest tree, but the best keeper, and also the most beautiful as well as the most delicious apple in the world. And this apple shall not be for us alone, but for all countries and for all people; and, where the apple will not grow, as in far-off India,

and also in many other places, there shall it be taken through the medium of commercial relations. With it shall civilization embrace the whole earth.

Nations shall meet nations, not as they do now, with the din of battle and the clash of arms: not with torpedoes, and deep-mouthed cannon, and also a gaudy display of bunting, nor with a desire for blood and carnage, engendered by hate; but with swords beaten into plow shares, and spears beaten into pruning hooks.

Then shall all the world be an extended Eden. Then shall all nations sit down together, under one grand triumphal arch, festooned with wreaths of apple blossoms, and garlanded with the fruit of every country. Then will we make a fruit offering to our Creator, and from this time shall the gates of Paradise be closed against us no longer. But there shall we remain until He who placed our first parents in the first Eden shall open to us the pearly gates of the eternal city wherein are growing fruits for the healing of all nations.

DISCUSSION.

Mr. Gibbs. There have been several allusions to the apple in the garden of Eden, some of them rather complimentary. As this seems to be a very late keeping variety and also extremely hardy, I would inquire if we had not better have it on the list for general cultivation? It was a little subject to blight, I believe, but as it is to be treated with sulphur hereafter, that need not be a serious objection.

Mr. Storrs moved that we tender a vote of thanks to Dr. Twitchell for his paper. The motion was seconded and unanimously carried.

STATE EXPERIMENTAL FARMS.

Mr. Dart. Think it would be a matter of intense interest to the society if we could have a report on the experimental farms.

I move that a committee of three be appointed from the members in the vicinity of St. Paul and Minneapolis, to visit the experimental grounds at the University and Excelsior.

The motion was seconded and carried.

Mr. Dart. Move that Mr. Eldridge, of Excelsior, be a member of that committee. The motion was seconded.

Mr. Eldridge. I am a young member of the society; am not a nurseryman, and don't consider myself able to judge on the experiments carried on at the farms, and also as I am a neighbor of Mr. Gideon, I would wish to be excused, and would like to see some one appointed in my place.

Mr. Gibbs. As Mr. Gideon don't hold any cordial relations to the Horticultural Society, and as the farm is under the control of

the Board of Regents, wouldn't it be better to have a report from them?

Mr. Dart. Don't believe there is any ill-feeling between Mr. Gideon and the society that would keep any of our committees off of the farm. I don't think that Mr. Gideon would refuse to show the committee around on the farm. And what we want is a report from our own committee. Think that Mr. Eldridge's being a neighbor to Mr. Gideon wouldn't be objectionable on that account.

Mr. Eldridge. If I should act on that committee, I would rather have five members.

Pres. Grimes. It is much easier to get a committee of three together than one of five.

Mr. Harris. Think Mr. Elliot would be a very good man. Move that he be a member. The motion was seconded and carried.

Mr. Eldridge. I would move that Mr. Cook take my place.

Mr. Cook. It does not seem to me that Mr. Eldridge's reason is acceptable. Think it is best to have a man that is near at hand, and think he is just the man.

Mr. Eldridge. I move that Mr. Cook be the third man on the committee. The motion was seconded and carried.

The motion of Mr. Eldridge was then also carried.

REPORT OF MR. FISH.

The Secretary then read the report of Geo. H. Fish, which was ordered on file for publication. The report was as follows:

REPORT OF G. H. FISH, SAUK CENTRE, MINN.

MR. PRESIDENT: Previous to last April I had been absent from my home two years, living during the time at Fargo, D. T., hence I will not attempt a very minute report. At Sauk Centre and vicinity the crab varieties seem to be thrifty, hardy and bearing well. I cannot say that any of the Standards are bearing, excepting a few trees on timber lands.

In the Red River Valley the *crabs* appeared hardy and thrifty.

G. H. FISH.

MR. CARTER'S FRUIT REPORT.

Mr. Carter was called upon and read his report, which was ordered on file and reads as follows:

St. Peter, Minn., January 23d, 1880.

Prof. C. Y. Lacy, Secretary Minnesota Horticultural Society:

Dear Sir—During the season of 1879 the fruit crop in this vicinity was very much reduced by the frost or rather *freeze*, which occurred when the apple trees were in blossom. Nevertheless I think there was a larger crop of standard apples than ever before. The storm of July 3d made sad havoc in some of the Le Sueur county orchards, notably that of L. B. Carpenter, of Lake Emily. He and several others had many trees, some very large ones, torn up by the roots, twisted off or otherwise injured. In some orchards no damage was done except shaking off the fruit. Notwithstanding all of these backsets, several hundred bushels of standard apples must have been raised within a radius of fifteen miles of this place.

Varieties: Duchess, Tetofsky, Haas and Wealthy, and some Walbridge, Pewaukee, Fameuse, and Ben Davis. The more tender varieties named were generally raised near some of the lakes in the timber in Le Sueur and Blue Earth counties. The Transcendent was not so plentiful as in former years, as it has blighted badly on our prairies, and in some localities in the timber. There were a few nice pears raised in the timber, but I have not been able to learn the locality and do not know the variety. They were probably the Flemish Beauty, although it is not hardy except when protected by a lake in the timber. The Duchess and Haas seemed to be the most plentiful; the Wealthy only beginning to bear. The plum crop was a failure, owing to the frost. Currants were a moderate crop. Raspberries a failure, owning to winter-killing mainly. Strawberries were a short crop on account of the frost. Large quantities of strawberries and blueberries, and some raspberries were imported. Grape crop was caught by the freeze in the fall. Standard apples were bought by our grocers at from $1.25 to $1.50 per bushel. Transcendents and Hyslops at 60 to 80 cents. Strawberries sold readily at 15 cents. Currants about $2.00 per bushel.

Those who raised fruit for sale claim that the land devoted to its culture yields a larger profit one year with another than any other crop.

MR. STORRS' REPORT.

The Secretary. I have a report from Mr. Storrs, but it is quite long and he has given considerable of it before. Perhaps he could give us the new things in his report verbally.

Mr. Harris. I move the report be accepted without reading, because of the want of time, as is often done.

Motion was seconded and carried. The following is the report:

Winsted Lake, Minn., Jan. 13th, 1880.

Mr. President and members of Minnesota State Horticultural Society:

In this my annual report, I will give a brief history of my failures and successes in trying to grow fruit in Minnesota.

First Planting in 1858.

We came to this State in 1856, and the fall of '57 went back to the State of Michigan; returned in the spring of '58, bringing with us about 100 one-year trees of apple, plum and cherry, and several sprouts of currants, which we planted on our claim.

They all grew finely the first season, but the following winter killed the cherry trees, while the plum and apple trees were more or less injured. Many of the apple trees were entirely killed. They continued to kill back each winter, and when we went into the army in '61, not more than eight or ten remained, which we left in charge of a neighbor, but on our return in '64, found nothing left of any of them but the currants, which were doing well and in bearing. Like many others, we then said that apples *could not* be grown in Minnesota. Two years after we saw fine fruit growing in Hennepin Co., which was more than we ever expected to see, and right there I made up my mind if others could grow apples, *I could*. This was the fall of '66. But how to go to work to do this was a question we could not solve.

Second Planting in 1867.

Fortunately a tree peddler came along taking orders for a nursery in Wisconsin. He had cuts and drawing of fine fruit, and of course they were all hardy, *warranted* to stand any winter. I gave my order for $30.00 worth, consisting of Ben Davis, Golden Russet, Perry Russet, Tolman Sweet, Sweet Pear, Red Astrachan, and several other kinds.

They came in the fall and set the next spring. We then set from twenty-five to fifty each spring until '72. All had grown well and some had bloomed the spring of '72. In the fall of '72 we set in orchard, about 75 one-year old trees, (Minn. grown) and planted them out as soon as we got home. But oh! what a sight in the spring of '73, our yearlings that was set in the fall, were nearly all dead, there being six wealthy in the lot, that was not killed only down to the snow; Winsted Pippin the same, and both the Wealthy and Winsted are now fine trees and in bearing, and of the others that had been set from one to five years, many were dead, while others leaved out and died before fall. That spring I received a circular from Mr. John S. Harris, to be filled out, giving names of varieties that had been winter killed and of those that had come through the winter without any injury. Those that were then leaved out nicely and showed but little signs of injury, died before the middle of July. The most of them were root-killed, and to-day I have only two trees left that was of that lot and those are the Duchess, and of the yearlings above referred to about twelve.

About this time we began to think that a man must be educated in horticulture before he could be successful in growing apples; since which time we have planted nothing in our orchard that was not Minnesota grown, or, if grown elsewhere, had proved itself worthy. We commenced here with our bare hands, with no resources, only what we earned by hard labor; had deprived ourselves of many comforts of life to save money to pay for fruit trees, and all trees purchased previous to the hard winter of '72 and '73 cost from 50 cents to $1.00 each, of which we had about 250. But we did not give up in despair, but dug out the dead ones and reset with others.

Planting.

Another error we have discovered. The first three or four years we set trees according to directions,—two inches deeper than they grew in the nursery. This, we concluded, was wrong, as many trees each winter were root-killed; but since we set ten to twelve inches deep, and set in clay, we have no root-killing.

We will now give a few hints in planting, cultivation, and care of the orchard, from our own experience.

Spring *is* the proper time to set trees. The ground should be plowed as deep as possible, and marked off in rows, both ways. The rows should be sixteen or twenty feet apart. The holes should be dug large and deep, four feet in diameter, and two or two and a half feet deep; then fill in the top soil to within one foot of top. Trees should be set in water a few hours previous to setting; cut smooth from the under side all broken or bruised roots, then place the tree in the hole and straighten all the roots, and work among the roots fine soil with a portion of the clay that came from the bottom,—mixing the clay and top-soil together. If the ground is dry, put in a pail full of water, and move the tree carefully, so that the water will soak in around the roots; then fill in more soil, and press with the foot, and put a part of the clay near the surface, as this helps hold the tree firm. Tramp the top firm, and put on about two or three inches of mellow soil on top, or enough to have it a few inches higher than the natural level. The tree should be leaned a little to the southwest. Plant the ground to some hoed crop. I prefer corn, as the corn gets up four or five feet high by the middle of July and shades the ground; this checks the growth, and the trees mature their wood earlier.

Cultivation

should be commenced as soon as the weeds start, and the ground kept clean of weeds until July 1st. In the fall, before the ground freezes, mulch well with old, half-rotted straw.

After the first year I commence cultivating as soon as the frost is out of the ground, by plowing light and harrowing down smooth; this gives the tree an early start, and my experience is that when a tree makes its growth early it will ripen its wood early, and to do this they must be forced in the spring with clean cultivation until the last of June, when all cultivation should cease, weeds or no weeds. If the weeds get too thick and large mow them off with a scythe and leave them around the trees.

Salt

may be profitably used around fruit trees of all kinds. Our experience in the use of salt has been very satisfactory. It makes trees bear better, as it checks the growth and the fruit buds form more readily. It is also a good preventative of blight, as has been proven in my own orchard and in the neighborhood. A man come to me last summer and said his trees were all dying. On questioning him, found it was blight. I told him to go home and put a quart of salt around each tree. He did so, and the blight ceased. The cause, I think, is this: Trees blight when they are growing the

rapidest, and salt checks the growth of the tree for a time, and this checks the blight.

Cleanliness

we consider just as essential in the growth and health of an orchard as good cultivation. We all admit that cleanliness is necessary in the animal kingdom, and in our opinion it is as essential in the vegetable kingdom. This important part of the care of an orchard is too often neglected. Spring is the proper time to wash the trunks and see that the black looking places are washed clean, remembering that cleanliness is one of the first laws of health. The past season was a fruitful one in our district. Apples were in abundance, cherries and plums a fair crop, grapes never fruited so prolific as last season, currants and gooseberries were a full crop, strawberries a total failure, caused, we think, by a heavy rain-storm when the vines were in blossom, which washed the polen from the bloom.

Hardiness and Varieties.

Below we will give the condition of apple trees in our orchard and vicinity as to hardiness—a test of five years: No. 1 (one) being perfectly iron-clad; No. 2, second hardy, &c. Standards—Wealthy, 1; Duchess, 1; Tetofsky, 1; Winsted Pippin, 1; Haas, 2; Plum's Cider, 2; Pioneer, 2; Culver's Greening, 3; Hoffman, 3; Allen's Swaar, 3; Pewaukee, 4; Russian August, 2; Fameuse, 4; Walbridge, top-worked on Transcendent, 5; Saxton, 4; Wolf River, 3; Telfer Sweet, 3. Of Russians, designated by numbers—No. 344, 1; No. 200, 2; No. 375, 1; No. 210, 1; No. 310, 2. White Astrachan, 2; St. Lawrence, 2; Peach Apple, 1; Picket's No. 5, 1; Drake, 2.

We also have as many more of Russians and other kinds that have not been tested thoroughly. Of crabs and hybrids—Early Strawberry, 1; Orange, 1; Beecher's Sweet, 1; Bruer's Sweet, 1; Whitney's No. 20, 1; Boomer, 1; Nuttall, 1; Hesper Blush, 2; Maiden's Blush, 1; Jewel's No. 12, 1; Conicle, 2; Pembina, 1; Stewart's Sweet, 1; Hebron, 1; Canada Black, 1; General Grant, 1; Orion, 2; Webb's Winter, 1; Stubb's Prize, 2; Le Sueur, 1, Pride of Minneapolis, 1; Walter's Sweet Winter, 1; Honey Sweet, 1; Virginia Crab, 1; Minnesota, 1; Meader's Winter, 2; Martha, 1; Florence, 1; Striped Winter, 2, and a large yellow crab, larger than Orange, the name we do not know, No. 1.

We will say before closing that we are making fruit growing a decided success, and as for profit we expect to make more money from our fruit than by growing wheat.

To-day we examined the Flemish Beauty Pear and find them in good condition. Hoping this may meet the approval of the Society,

I am, respectfully yours,

O. D. STORRS.

Here Mr. Pearce distributed some cions of the Powers Large Red Crab.

MR. DART'S REPORT.

Mr. Dart. The first crop with us was almost a failure. Would call your attention to one part of my section on account

of the great difference in the bearing of orchards. Some orchards there were almost entire failures, while in orchards near by there was a passable crop. On inquiry, I found that the passable crop was gathered from trees that were well mulched, or left in grass sod. Now, I wouldn't be understood as advocating or advising mulching and loaming trees in sod. But it is a fact with us that the trees that were mulched or left in grass bore better than those that were cultivated. I received one of those blanks presented here, and, as far as I can judge, the crop raised amounted to 1,000 bushels, including crabs. There were imported to Owatonna, in all, about 3,500 bushels. Think it was the smallest crop we ever had. Crabs have failed more than the apples. The trees that were mulched and sodded didn't come to fruit so soon as the cultivated ones, and consequently they didn't die.

MR. HALL'S PAPER.

The Secretary. I have a communication here from Mr. Hall, of Rochester, on the strawberry, which probably ought to have been read while we were discussing that subject.

It was moved to be placed on file, which motion was carried. The following was the paper:

ROCHESTER, MINN., Jan. 19, 1880.

C. Y. Lacy, Esq., Minneapolis, Minn.,—

DEAR SIR: I received the circular of yours, and regret my inability to attend the meeting of the State Horticultural Society. I have been cultivating strawberries to some extent for several years past, and perhaps a word upon my experience would be of interest. I regard my location as one of the best in Southern Minnesota, and have always succeeded in getting a crop of berries. This last season my vines were heavily laden with fruit, notwithstanding the discouraging reports of other small fruit men, who lost their berries by frost-killing. My location is a side-hill, sloping to the west, affording ample drainage. The soil is rich, black sand; new ground, but has never been manured. I have fifteen different varieties, including such standard varieties as the Green Prolific, Wilson, Cramer's Seedling, Hart Seedling, etc. Am cultivating about two acres of ground. The yield last season was at the rate of 200 bushels per acre, only a portion of the ground bearing, owing to a part of the vines being pistillate. And right here I may drop a word of caution to those who desire to plant largely, not to patronize irresponsible men who palm off pistillates for productive plants. I advise thorough cultivation, for in this lies the secret of success. Some of my berries this year measured 4½ inches in circumference, and were delicious in flavor, as the members of our County Society can bear testimony.

Regretting my inability to attend the meeting at Minneapolis and join in the discussions, I remain,

Yours respectfully, JAS. M. HALL.

LETTER FROM J. L. BLAIR.

The Secretary read a communication from Mr. Blair, of St. Charles. The communication was ordered on file and reads as follows:

ST. CHARLES, Jan. 21st, 1880.

Prof. Lacy:

DEAR SIR:—I received your announcement of the annual meeting of the Minnesota State Horticultural Society. I am sorry that I cannot attend. I should like to know if the Haas apple tree usually blights as soon as it commences bearing. I had six young trees that blossomed for the first time last spring, three of them dropped their blossoms and remained healthy, the other three bore 2, 3 and 5 apples and were hurt with blight, all in the same row of trees and treated the same.

Yours with respect,

JOHN L. BLAIR.

Mr. Harris. With my Wealthy and Haas the blight comes in as soon as they commence to bear.

Mr. Eldridge. This is not my experience. My Haas didn't blight at all while some others did.

Mr. Harris. A little blight is a good thing for the Haas. I think it gets up pretty quick then.

LETTER FROM WM. M'HENRY.

The Secretary read a letter from Wm. McHenry, St. Charles. This was ordered on file and reads as follows:

ST. CHARLES, MINN, Jan. 19, 1880.

Mr. C. Y. Lacy:

DEAR SIR:—I had hoped to be at the Association meeting. Business prevents me, so I want to say that my report is very imperfect as you see, and figures are small in this section of the country. The late frost killed nearly all the fruit at Minnesota City. I found one orchard that produced 300 bushels of Apples, another, 75 bushels; these were all Red Astrachan, Snow and a few Haas. We have a few seedling in this County that have never been brought to the notice of your society. We shall watch and wait to see the result of this winter. I find some of the tender varieties are more or less injured. I have been testing the Henrietta raspberry for the past two years. Two years ago I had some very fine samples of berries: last spring they came out all right, had made about two inches growth when the late frost took them and killed every bush to the ground, did not get a

single berry. Shall try them another year before I give them up. Wishing the society one of the best of times, regretting that I can't be with you, I remain, Yours truly,

WM. McHENRY.

FRUIT STATISTICS.

President Grimes asked a question about the blank fruit reports that had been sent out during the summer.

The Secretary. Of those blank fruit reports sent out, about 15 have been returned. Very few arrived until a very few days before the session began. Consequently I have not had time to look into them and see what could be tabulated.

President Grimes. The object of having them sent out was to remind our brethren that we were alive, and to invite them to this meeting. It was principally done to show them that we were trying to do something.

Mr. Dart. As but few have been received, and these would show poorly in our Transactions, I think we had better leave them out. When we undertake to show statistics we had better make a fair showing, and if we can't make a fair showing we had better leave our statistics out.

DELEGATE CREDENTIALS.

The Secretary. I am informed that Mr. Underwood intends to attend the meetings of the Wisconsin Horticultural Society. If there are any members that have any fruit they wish to exhibit there, he is willing to take it along. And I would suggest this general motion:

Resolved, That the Secretary be directed to issue delegate credentials to any member of this Society who may state his intention to attend the meetings of kindred societies.

Mr. Dart. I move that the Secretary be thus instructed.

The motion was seconded and carried.

PROPERTY OF SOCIETY.

The Secretary. I have considerable property of the Society in my hands now, and would say that it only awaits the disposal of the Society. If you have no desire of removing it to some other place, it can remain where it is in perfect safety until called for.

TRANSACTIONS PRINTED.

Mr. Gibbs. Wish to inquire how many copies of our Transactions are printed and how the distribution is made.

The Secretary answered that 2,500 copies are printed; that a certain number are used in distributing to members of the Legislature, State officers, newspapers of the State, and to County Agricultural and Horticultural Societies; that the balance were turned over to this Society; that the Secretary had made a rule of sending single copies to any one requesting them, and full sets upon receipt of membership fee of one dollar.

Mr. Harris. I move that we adjourn till the third Tuesday of next January.

The motion was seconded and carried.

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